

Computer algebra independent integration tests

1-Algebraic-functions/1.1-Binomial-products/1.1.1-Linear/1.1.1.4-a+b-x^m-
c+d-xⁿ-e+f-x^p-g+h-x^q

Nasser M. Abbasi

May 13, 2020

Compiled on May 13, 2020 at 7:58am

Contents

1	Introduction	9
1.1	Listing of CAS systems tested	9
1.2	Results	10
1.3	Performance	13
1.4	list of integrals that has no closed form antiderivative	14
1.5	list of integrals solved by CAS but has no known antiderivative	14
1.6	list of integrals solved by CAS but failed verification	14
1.7	Timing	15
1.8	Verification	15
1.9	Important notes about some of the results	15
1.10	Design of the test system	17
2	detailed summary tables of results	19
2.1	List of integrals sorted by grade for each CAS	19
2.2	Detailed conclusion table per each integral for all CAS systems	21
2.3	Detailed conclusion table specific for Rubi results	53
3	Listing of integrals	61
3.1	$\int (a + bx)(c + dx)(e + fx)(g + hx) dx$	61
3.2	$\int \frac{(a+bx)(c+dx)(e+fx)}{g+hx} dx$	65
3.3	$\int \frac{(a+bx)(c+dx)}{(e+fx)(g+hx)} dx$	69

3.4	$\int \frac{a+bx}{(c+dx)(e+fx)(g+hx)} dx$	73
3.5	$\int \frac{1}{(a+bx)(c+dx)(e+fx)(g+hx)} dx$	76
3.6	$\int \frac{x}{(1+x)(2+x)(3+x)} dx$	80
3.7	$\int \frac{-x^2+x^3}{(-6+x)(3+5x)^3} dx$	83
3.8	$\int \frac{(a+bx)^3 \sqrt{c+dx}(e+fx)}{x} dx$	87
3.9	$\int \frac{(a+bx)^2 \sqrt{c+dx}(e+fx)}{x} dx$	93
3.10	$\int \frac{(a+bx) \sqrt{c+dx}(e+fx)}{x} dx$	98
3.11	$\int \frac{\sqrt{c+dx}(e+fx)}{x} dx$	102
3.12	$\int \frac{\sqrt{c+dx}(e+fx)}{x(a+bx)} dx$	106
3.13	$\int \frac{\sqrt{c+dx}(e+fx)}{x(a+bx)^2} dx$	111
3.14	$\int \frac{\sqrt{c+dx}(e+fx)}{x(a+bx)^3} dx$	116
3.15	$\int \frac{\sqrt{a+bx}(c+dx)^3(e+fx)}{x} dx$	122
3.16	$\int \frac{\sqrt{a+bx}(c+dx)^2(e+fx)}{x} dx$	128
3.17	$\int \frac{\sqrt{a+bx}(c+dx)(e+fx)}{x} dx$	133
3.18	$\int \frac{\sqrt{a+bx}(e+fx)}{x} dx$	137
3.19	$\int \frac{\sqrt{a+bx}(e+fx)}{x(c+dx)} dx$	141
3.20	$\int \frac{\sqrt{a+bx}(e+fx)}{x(c+dx)^2} dx$	146
3.21	$\int \frac{\sqrt{a+bx}(e+fx)}{x(c+dx)^3} dx$	151
3.22	$\int \frac{x^3(1+ax)}{\sqrt{ax}\sqrt{1-ax}} dx$	157
3.23	$\int \frac{x^2(1+ax)}{\sqrt{ax}\sqrt{1-ax}} dx$	162
3.24	$\int \frac{x(1+ax)}{\sqrt{ax}\sqrt{1-ax}} dx$	167
3.25	$\int \frac{1+ax}{\sqrt{ax}\sqrt{1-ax}} dx$	172
3.26	$\int \frac{1+ax}{x\sqrt{ax}\sqrt{1-ax}} dx$	176
3.27	$\int \frac{1+ax}{x^2\sqrt{ax}\sqrt{1-ax}} dx$	180
3.28	$\int \frac{1+ax}{x^3\sqrt{ax}\sqrt{1-ax}} dx$	184
3.29	$\int \frac{1+ax}{x^4\sqrt{ax}\sqrt{1-ax}} dx$	188
3.30	$\int \frac{1+ax}{x^5\sqrt{ax}\sqrt{1-ax}} dx$	192
3.31	$\int \frac{-1+2ax}{\sqrt{-1+xx^2}\sqrt{1+x}} dx$	196

3.32	$\int \frac{a^2x^2-(1-ax)^2}{\sqrt{-1+xx^2}\sqrt{1+x}} dx$	200
3.33	$\int \frac{A+Bx}{\sqrt{a+bx}\sqrt{c+\frac{b(-1+c)x}{a}}\sqrt{e+\frac{b(-1+e)x}{a}}} dx$	204
3.34	$\int \frac{A+Bx}{\sqrt{a+bx}\sqrt{c+dx}\sqrt{e+\frac{b(-1+e)x}{a}}} dx$	209
3.35	$\int \sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^3 dx$	214
3.36	$\int \sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^2 dx$	220
3.37	$\int \sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x) dx$	226
3.38	$\int \sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x} dx$	231
3.39	$\int \frac{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{7+5x} dx$	236
3.40	$\int \frac{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{(7+5x)^2} dx$	242
3.41	$\int \frac{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{(7+5x)^3} dx$	248
3.42	$\int \frac{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{(7+5x)^4} dx$	255
3.43	$\int \frac{\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}}{a+bx} dx$	262
3.44	$\int \frac{\sqrt{2-3x}\sqrt{1+4x}(7+5x)^3}{\sqrt{-5+2x}} dx$	271
3.45	$\int \frac{\sqrt{2-3x}\sqrt{1+4x}(7+5x)^2}{\sqrt{-5+2x}} dx$	277
3.46	$\int \frac{\sqrt{2-3x}\sqrt{1+4x}(7+5x)}{\sqrt{-5+2x}} dx$	283
3.47	$\int \frac{\sqrt{2-3x}\sqrt{1+4x}}{\sqrt{-5+2x}} dx$	288
3.48	$\int \frac{\sqrt{2-3x}\sqrt{1+4x}}{\sqrt{-5+2x}(7+5x)} dx$	293
3.49	$\int \frac{\sqrt{2-3x}\sqrt{1+4x}}{\sqrt{-5+2x}(7+5x)^2} dx$	298
3.50	$\int \frac{\sqrt{2-3x}\sqrt{1+4x}}{\sqrt{-5+2x}(7+5x)^3} dx$	304
3.51	$\int \frac{\sqrt{2-3x}(7+5x)^3}{\sqrt{-5+2x}\sqrt{1+4x}} dx$	311
3.52	$\int \frac{\sqrt{2-3x}(7+5x)^2}{\sqrt{-5+2x}\sqrt{1+4x}} dx$	317
3.53	$\int \frac{\sqrt{2-3x}(7+5x)}{\sqrt{-5+2x}\sqrt{1+4x}} dx$	322
3.54	$\int \frac{\sqrt{2-3x}}{\sqrt{-5+2x}\sqrt{1+4x}} dx$	327
3.55	$\int \frac{\sqrt{2-3x}}{\sqrt{-5+2x}\sqrt{1+4x}(7+5x)} dx$	331
3.56	$\int \frac{\sqrt{2-3x}}{\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^2} dx$	336
3.57	$\int \frac{\sqrt{2-3x}}{\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^3} dx$	342
3.58	$\int \frac{\sqrt{c+dx}}{(a+bx)\sqrt{e+fx}\sqrt{g+hx}} dx$	349

3.59	$\int \frac{(c+dx)^{3/2}}{(a+bx)\sqrt{e+fx}\sqrt{g+hx}} dx$	354
3.60	$\int \frac{(7+5x)^4}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}} dx$	361
3.61	$\int \frac{(7+5x)^3}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}} dx$	367
3.62	$\int \frac{(7+5x)^2}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}} dx$	372
3.63	$\int \frac{7+5x}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}} dx$	377
3.64	$\int \frac{1}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}} dx$	382
3.65	$\int \frac{1}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)} dx$	386
3.66	$\int \frac{1}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^2} dx$	390
3.67	$\int \frac{1}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^3} dx$	396
3.68	$\int \frac{c+dx}{\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}} dx$	403
3.69	$\int \frac{a+bx}{\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}} dx$	407
3.70	$\int \frac{1}{(a+bx)\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}} dx$	412
3.71	$\int \frac{1}{(a+bx)(c+dx)^{3/2}\sqrt{e+fx}\sqrt{g+hx}} dx$	416
3.72	$\int \frac{1}{(a+bx)(c+dx)^{5/2}\sqrt{e+fx}\sqrt{g+hx}} dx$	423
3.73	$\int \frac{1}{(a+bx)\sqrt{c+dx}\sqrt{1-fx}\sqrt{1+fx}} dx$	430
3.74	$\int \frac{1}{(a+bx)\sqrt{c+dx}\sqrt{1-f^2x^2}} dx$	434
3.75	$\int \frac{1}{(a+bx)\sqrt{c+dx}\sqrt{1-f^2x}\sqrt{1+f^2x}} dx$	438
3.76	$\int \frac{1}{(a+bx)\sqrt{c+dx}\sqrt{1-f^4x^2}} dx$	442
3.77	$\int \sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^{5/2} dx$	446
3.78	$\int \sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^{3/2} dx$	454
3.79	$\int \sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}\sqrt{7+5x} dx$	461
3.80	$\int \frac{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{\sqrt{7+5x}} dx$	468
3.81	$\int \frac{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{(7+5x)^{3/2}} dx$	475
3.82	$\int \frac{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{(7+5x)^{5/2}} dx$	482
3.83	$\int \frac{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{(7+5x)^{7/2}} dx$	489
3.84	$\int \frac{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{(7+5x)^{9/2}} dx$	496
3.85	$\int \frac{\sqrt{2-3x}\sqrt{1+4x}(7+5x)^{5/2}}{\sqrt{-5+2x}} dx$	503
3.86	$\int \frac{\sqrt{2-3x}\sqrt{1+4x}(7+5x)^{3/2}}{\sqrt{-5+2x}} dx$	510

3.87	$\int \frac{\sqrt{2-3x}\sqrt{1+4x}\sqrt{7+5x}}{\sqrt{-5+2x}} dx$	517
3.88	$\int \frac{\sqrt{2-3x}\sqrt{1+4x}}{\sqrt{-5+2x}\sqrt{7+5x}} dx$	524
3.89	$\int \frac{\sqrt{2-3x}\sqrt{1+4x}}{\sqrt{-5+2x}(7+5x)^{3/2}} dx$	531
3.90	$\int \frac{\sqrt{2-3x}\sqrt{1+4x}}{\sqrt{-5+2x}(7+5x)^{5/2}} dx$	537
3.91	$\int \frac{\sqrt{2-3x}\sqrt{1+4x}}{\sqrt{-5+2x}(7+5x)^{7/2}} dx$	544
3.92	$\int \frac{\sqrt{2-3x}\sqrt{1+4x}}{\sqrt{-5+2x}(7+5x)^{9/2}} dx$	551
3.93	$\int \frac{\sqrt{2-3x}(7+5x)^{5/2}}{\sqrt{-5+2x}\sqrt{1+4x}} dx$	558
3.94	$\int \frac{\sqrt{2-3x}(7+5x)^{3/2}}{\sqrt{-5+2x}\sqrt{1+4x}} dx$	565
3.95	$\int \frac{\sqrt{2-3x}\sqrt{7+5x}}{\sqrt{-5+2x}\sqrt{1+4x}} dx$	572
3.96	$\int \frac{\sqrt{2-3x}}{\sqrt{-5+2x}\sqrt{1+4x}\sqrt{7+5x}} dx$	579
3.97	$\int \frac{\sqrt{2-3x}}{\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^{3/2}} dx$	583
3.98	$\int \frac{\sqrt{2-3x}}{\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^{5/2}} dx$	588
3.99	$\int \frac{\sqrt{a+bx}\sqrt{c+dx}}{\sqrt{e+fx}\sqrt{g+hx}} dx$	595
3.100	$\int \frac{\sqrt{c+dx}}{(a+bx)^{3/2}\sqrt{e+fx}\sqrt{g+hx}} dx$	601
3.101	$\int \frac{(7+5x)^{5/2}}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}} dx$	607
3.102	$\int \frac{(7+5x)^{3/2}}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}} dx$	614
3.103	$\int \frac{\sqrt{7+5x}}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}} dx$	621
3.104	$\int \frac{1}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}\sqrt{7+5x}} dx$	625
3.105	$\int \frac{1}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^{3/2}} dx$	629
3.106	$\int \frac{1}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^{5/2}} dx$	635
3.107	$\int \frac{(a+bx)^{3/2}}{\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}} dx$	642
3.108	$\int \frac{\sqrt{a+bx}}{\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}} dx$	648
3.109	$\int \frac{1}{\sqrt{a+bx}\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}} dx$	653
3.110	$\int \frac{1}{(a+bx)^{3/2}\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}} dx$	657
3.111	$\int \frac{1}{(a+bx)^{3/2}(c+dx)^{3/2}\sqrt{e+fx}\sqrt{g+hx}} dx$	665
3.112	$\int \frac{x^4(e+fx)^n}{(a+bx)(c+dx)} dx$	669
3.113	$\int \frac{x^3(e+fx)^n}{(a+bx)(c+dx)} dx$	673

3.114	$\int \frac{x^2(e+fx)^n}{(a+bx)(c+dx)} dx$	677
3.115	$\int \frac{x(e+fx)^n}{(a+bx)(c+dx)} dx$	681
3.116	$\int \frac{(e+fx)^n}{(a+bx)(c+dx)} dx$	685
3.117	$\int \frac{(e+fx)^n}{x(a+bx)(c+dx)} dx$	689
3.118	$\int \frac{(e+fx)^n}{x^2(a+bx)(c+dx)} dx$	693
3.119	$\int (a+bx)^m(c+dx)(e+fx)(g+hx) dx$	697
3.120	$\int \frac{(a+bx)^m(c+dx)(e+fx)}{g+hx} dx$	706
3.121	$\int \frac{(a+bx)^m(c+dx)}{(e+fx)(g+hx)} dx$	710
3.122	$\int \frac{(a+bx)^m}{(c+dx)(e+fx)(g+hx)} dx$	714
3.123	$\int \frac{x^m(e+fx)^n}{(a+bx)(c+dx)} dx$	718
3.124	$\int (a+bx)^m(c+dx)^n(e+fx)(g+hx) dx$	722
3.125	$\int (a+bx)^m(c+dx)^{1-m}(e+fx)(g+hx) dx$	726
3.126	$\int (a+bx)^m(c+dx)^{-m}(e+fx)(g+hx) dx$	730
3.127	$\int (a+bx)^m(c+dx)^{-1-m}(e+fx)(g+hx) dx$	734
3.128	$\int (a+bx)^m(c+dx)^{-2-m}(e+fx)(g+hx) dx$	738
3.129	$\int (a+bx)^m(c+dx)^{-3-m}(e+fx)(g+hx) dx$	742
3.130	$\int (a+bx)^m(c+dx)^{-4-m}(e+fx)(g+hx) dx$	746
3.131	$\int (a+bx)^m(c+dx)^{-5-m}(e+fx)(g+hx) dx$	751
3.132	$\int (a+bx)^3(c+dx)^{-4-m}(e+fx)^m(g+hx) dx$	758
3.133	$\int (a+bx)^2(c+dx)^{-4-m}(e+fx)^m(g+hx) dx$	766
3.134	$\int (a+bx)(c+dx)^{-4-m}(e+fx)^m(g+hx) dx$	772
3.135	$\int (c+dx)^{-4-m}(e+fx)^m(g+hx) dx$	777
3.136	$\int \frac{(A+Bx)(c+dx)^n(e+fx)^p}{a+bx} dx$	781
3.137	$\int \frac{(a+bx)^m(A+Bx)(c+dx)^{-m}}{e+fx} dx$	785
3.138	$\int \frac{(A+Bx)(c+dx)^n(e+fx)^p}{\sqrt{a+bx}} dx$	790
3.139	$\int (a+bx)^m(c+dx)^n(e+fx)^p(g+hx)^3 dx$	795
3.140	$\int (a+bx)^m(c+dx)^n(e+fx)^p(g+hx)^2 dx$	800
3.141	$\int (a+bx)^m(c+dx)^n(e+fx)^p(g+hx) dx$	805
3.142	$\int (a+bx)^m(c+dx)^n(e+fx)^p dx$	809
3.143	$\int \frac{(a+bx)^m(c+dx)^n(e+fx)^p}{g+hx} dx$	813
3.144	$\int (a+bx)^m(A+Bx)(c+dx)^n(e+fx)^{-m-n} dx$	816
3.145	$\int (a+bx)^m(A+Bx)(c+dx)^n(e+fx)^{-1-m-n} dx$	820
3.146	$\int (a+bx)^m(A+Bx)(c+dx)^n(e+fx)^{-2-m-n} dx$	825
3.147	$\int (a+bx)^m(A+Bx)(c+dx)^n(e+fx)^{-3-m-n} dx$	830
3.148	$\int (a+bx)^m(A+Bx)(c+dx)^n(e+fx)^{-4-m-n} dx$	834
3.149	$\int \frac{x(a+bx+cx^2)}{\sqrt{1-dx}\sqrt{1+dx}} dx$	839

3.150	$\int \frac{a+bx+cx^2}{\sqrt{1-dx}\sqrt{1+dx}} dx$	843
3.151	$\int \frac{a+bx+cx^2}{x\sqrt{1-dx}\sqrt{1+dx}} dx$	847
3.152	$\int \frac{a+bx+cx^2}{x^2\sqrt{1-dx}\sqrt{1+dx}} dx$	852
3.153	$\int \frac{a+bx+cx^2}{x^3\sqrt{1-dx}\sqrt{1+dx}} dx$	857
3.154	$\int \frac{x(a+bx+cx^2)}{\sqrt{-1+dx}\sqrt{1+dx}} dx$	862
3.155	$\int \frac{a+bx+cx^2}{\sqrt{-1+dx}\sqrt{1+dx}} dx$	867
3.156	$\int \frac{a+bx+cx^2}{x\sqrt{-1+dx}\sqrt{1+dx}} dx$	871
3.157	$\int \frac{a+bx+cx^2}{x^2\sqrt{-1+dx}\sqrt{1+dx}} dx$	876
3.158	$\int \frac{a+bx+cx^2}{x^3\sqrt{-1+dx}\sqrt{1+dx}} dx$	881
3.159	$\int \frac{a+bx+cx^2}{x^4\sqrt{-1+dx}\sqrt{1+dx}} dx$	886
4	Listing of Grading functions	891

Chapter 1

Introduction

This report gives the result of running the computer algebra independent integration problems. The listing of the problems are maintained by and can be downloaded from <https://rulebasedintegration.org>

The number of integrals in this report is [159]. This is test number [15].

1.1 Listing of CAS systems tested

The following systems were tested at this time.

1. Mathematica 12.1 (64 bit) on windows 10.
2. Rubi 4.16.1 in Mathematica 12 on windows 10.
3. Maple 2020 (64 bit) on windows 10.
4. Maxima 5.43 on Linux. (via sagemath 8.9)
5. Fricas 1.3.6 on Linux (via sagemath 9.0)
6. Sympy 1.5 under Python 3.7.3 using Anaconda distribution.
7. Giac/Xcas 1.5 on Linux. (via sagemath 8.9)

Maxima, Fricas and Giac/Xcas were called from inside SageMath. This was done using SageMath integrate command by changing the name of the algorithm to use the different CAS systems.

Sympy was called directly using Python.

1.2 Results

Important note: A number of problems in this test suite have no antiderivative in closed form. This means the antiderivative of these integrals can not be expressed in terms of elementary, special functions or Hypergeometric2F1 functions. RootSum and RootOf are not allowed.

If a CAS returns the above integral unevaluated within the time limit, then the result is counted as passed and assigned an A grade.

However, if CAS times out, then it is assigned an F grade even if the integral is not integrable, as this implies CAS could not determine that the integral is not integrable in the time limit.

If a CAS returns an antiderivative to such an integral, it is assigned an A grade automatically and this special result is listed in the introduction section of each individual test report to make it easy to identify as this can be important result to investigate.

The results given in in the table below reflects the above.

System	solved	Failed
Rubi	% 99.37 (158)	% 0.63 (1)
Mathematica	% 97.48 (155)	% 2.52 (4)
Maple	% 80.5 (128)	% 19.5 (31)
Maxima	% 13.21 (21)	% 86.79 (138)
Fricas	% 29.56 (47)	% 70.44 (112)
Sympy	% 23.9 (38)	% 76.1 (121)
Giac	% 24.53 (39)	% 75.47 (120)

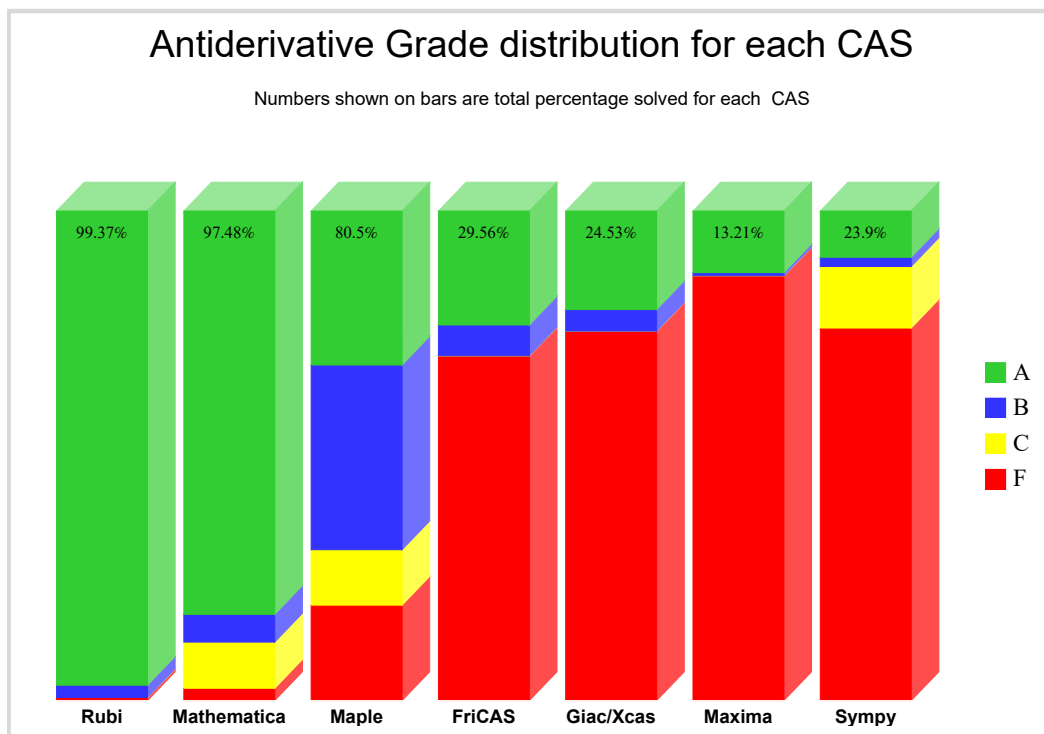
The table below gives additional break down of the grading of quality of the antiderivatives generated by each CAS. The grading is given using the letters A,B,C and F with A being the best quality. The grading is accomplished by comparing the antiderivative generated with the optimal antiderivatives included in the test suite. The following table describes the meaning of these grades.

grade	description
A	Integral was solved and antiderivative is optimal in quality and leaf size.
B	Integral was solved and antiderivative is optimal in quality but leaf size is larger than twice the optimal antiderivatives leaf size.
C	Integral was solved and antiderivative is non-optimal in quality. This can be due to one or more of the following reasons <ol style="list-style-type: none"> 1. antiderivative contains a hypergeometric function and the optimal antiderivative does not. 2. antiderivative contains a special function and the optimal antiderivative does not. 3. antiderivative contains the imaginary unit and the optimal antiderivative does not.
F	Integral was not solved. Either the integral was returned unevaluated within the time limit, or it timed out, or CAS hanged or crashed or an exception was raised.

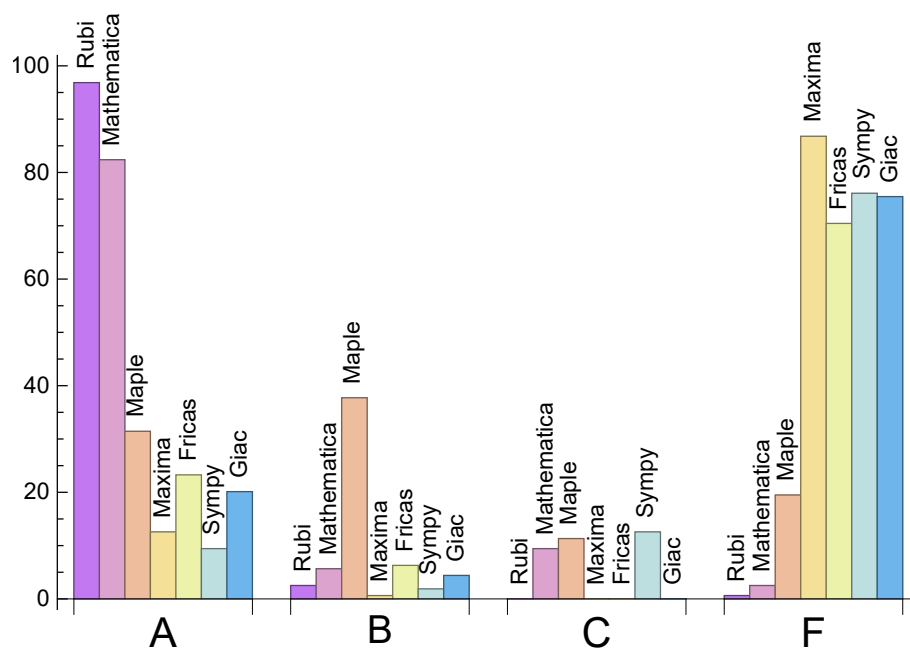
Grading is implemented for all CAS systems. Based on the above, the following table summarizes the grading for this test suite.

System	% A grade	% B grade	% C grade	% F grade
Rubi	96.86	2.52	0.	0.63
Mathematica	82.39	5.66	9.43	2.52
Maple	31.45	37.74	11.32	19.5
Maxima	12.58	0.63	0.	86.79
Fricas	23.27	6.29	0.	70.44
Sympy	9.43	1.89	12.58	76.1
Giac	20.13	4.4	0.	75.47

The following is a Bar chart illustration of the data in the above table.



The figure below compares the CAS systems for each grade level.



1.3 Performance

The table below summarizes the performance of each CAS system in terms of CPU time and leaf size of results.

System	Mean time (sec)	Mean size	Normalized mean	Median size	Normalized median
Rubi	0.24	223.98	1.05	191.5	1.
Mathematica	1.76	437.15	1.34	153.	0.9
Maple	0.03	1062.64	2.85	196.	1.81
Maxima	2.1	116.67	1.48	105.	1.67
Fricas	1.5	921.19	5.7	203.	3.69
Sympy	21.26	468.95	4.25	218.5	2.71
Giac	2.09	219.62	1.99	142.	1.81

1.4 list of integrals that has no closed form antiderivative

{143}

1.5 list of integrals solved by CAS but has no known antiderivative

Rubi {}

Mathematica {}

Maple {}

Maxima {}

Fricas {}

Sympy {}

Giac {}

1.6 list of integrals solved by CAS but failed verification

The following are integrals solved by CAS but the verification phase failed to verify the anti-derivative produced is correct. This does not mean necessarily that the anti-derivative is wrong, as additional methods of verification might be needed, or more time is needed (3 minutes time limit was used). These integrals are listed here to make it easier to do further investigation to determine why it was not possible to verify the result produced.

Rubi {136}

Mathematica {72, 77, 78, 79, 80, 81, 82, 85, 86, 87, 88, 89, 93, 94, 95, 96, 99, 101, 102, 107, 111, 132, 136, 146, 154, 155, 156, 157}

Maple Verification phase not implemented yet.

Maxima Verification phase not implemented yet.

Fricas Verification phase not implemented yet.

Sympy Verification phase not implemented yet.

Giac Verification phase not implemented yet.

1.7 Timing

The command `AboluteTiming[]` was used in Mathematica to obtain the elapsed time for each integrate call. In Maple, the command `Usage` was used as in the following example

```
cpu_time := Usage(assign ('result_of _int',int(expr,x)),output='realtime')
```

For all other CAS systems, the elapsed time to complete each integral was found by taking the difference between the time after the call has completed from the time before the call was made. This was done using Python's `time.time()` call.

All elapsed times shown are in seconds. A time limit of 3 minutes was used for each integral. If the integrate command did not complete within this time limit, the integral was aborted and considered to have failed and assigned an F grade. The time used by failed integrals due to time out is not counted in the final statistics.

1.8 Verification

A verification phase was applied on the result of integration for Rubi and Mathematica. Future version of this report will implement verification for the other CAS systems. For the integrals whose result was not run through a verification phase, it is assumed that the antiderivative produced was correct.

Verification phase has 3 minutes time out. An integral whose result was not verified could still be correct. Further investigation is needed on those integrals which failed verifications. Such integrals are marked in the summary table below and also in each integral separate section so they are easy to identify and locate.

1.9 Important notes about some of the results

1.9.1 Important note about Maxima results

Since these integrals are run in a batch mode, using an automated script, and by using `sagemath` (SageMath uses Maxima), then any integral where Maxima needs an interactive response from the user to answer a question during evaluation of the integral in order to complete the integration, will fail and is counted as failed.

The exception raised is `ValueError`. Therefore Maxima result below is lower than what could result if Maxima was run directly and each question Maxima asks was answered correctly.

The percentage of such failures were not counted for each test file, but for an example, for the Timofeev test file, there were about 30 such integrals out of total 705, or about 4 percent. This percentage can be higher or lower depending on the specific input test file.

Such integrals can be indentified by looking at the output of the integration in each section for Maxima. If the output was an exception `ValueError` then this is most likely due to this reason.

Maxima integrate was run using SageMath with the following settings set by default

```
'besselexpand : true'
'display2d : false'
'domain : complex'
'keepfloat : true'
'load(to_poly_solve)'
'load(simplify_sum)'
'load(abs_integrate)' 'load(diag)'
```

SageMath loading of Maxima `abs_integrate` was found to cause some problem. So the following code was added to disable this effect.

```
from sage.interfaces.maxima_lib import maxima_lib
maxima_lib.set('extra_definite_integration_methods', '[]')
maxima_lib.set('extra_integration_methods', '[]')
```

See <https://ask.sagemath.org/question/43088/integrate-results-that-are-different-from-using-maxima/> for reference.

1.9.2 Important note about FriCAS and Giac/X-CAS results

There are Few integrals which failed due to SageMath not able to translate the result back to SageMath syntax and not because these CAS system were not able to do the integrations.

These will fail With error `Exception raised: NotImplementedError`

The number of such cases seems to be very small. About 1 or 2 percent of all integrals.

Hopefully the next version of SageMath will have complete translation of FriCAS and XCAS syntax and I will re-run all the tests again when this happens.

1.9.3 Important note about finding leaf size of antiderivative

For Mathematica, Rubi and Maple, the buildin system function `LeafSize` is used to find the leaf size of each antiderivative.

The other CAS systems (SageMath and Sympy) do not have special buildin function for this purpose at this time. Therefore the leaf size is determined as follows.

For Fricas, Giac and Maxima (all called via `sagemath`) the following code is used

#see <https://stackoverflow.com/questions/25202346/how-to-obtain-leaf-count-expression-size-in>

```
def tree(expr):
    if expr.operator() is None:
        return expr
    else:
        return [expr.operator()+map(tree, expr.operands())

try:
    # 1.35 is a fudge factor since this estimate of leaf count is bit lower than
    #what it should be compared to Mathematica's
    leafCount = round(1.35*len(flatten(tree(anti))))
except Exception as ee:
    leafCount =1
```

For Sympy, called directly from Python, the following code is used

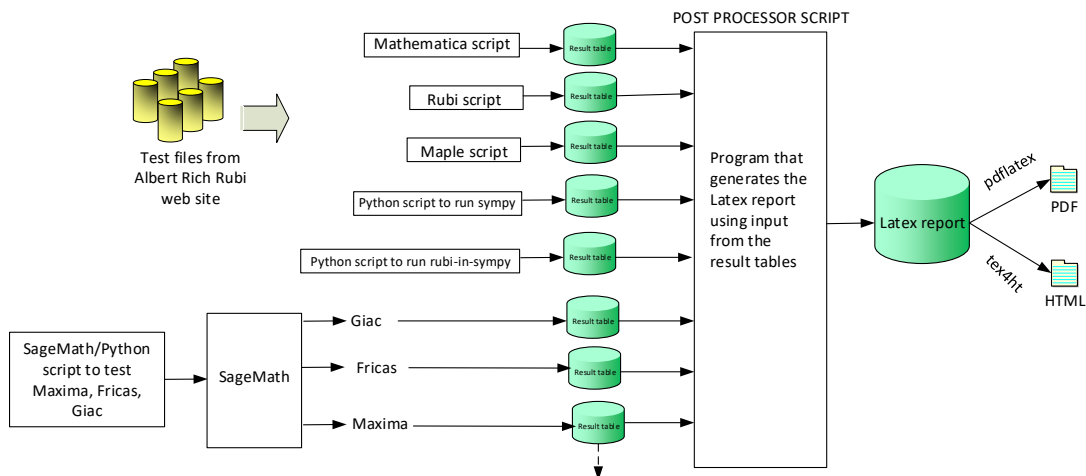
```
try:
    # 1.7 is a fudge factor since it is low side from actual leaf count
    leafCount = round(1.7*count_ops(anti))

except Exception as ee:
    leafCount =1
```

When these cas systems have a builtin function to find the leaf size of expressions, it will be used instead, and these tests run again.

1.10 Design of the test system

The following diagram gives a high level view of the current test build system.



One record (line) per one integral result. The line is CSV comma separated. It contains 13 fields. This is description of each record (line)

1. integer, the problem number.
2. integer. 0 or 1 for failed or passed. (this is not the grade field)
3. integer. Leaf size of result.
4. integer. Leaf size of the optimal antiderivative.
5. number. CPU time used to solve this integral. 0 if failed.
6. string. The integral in Latex format
7. string. The input used in CAS own syntax.
8. string. The result (antiderivative) produced by CAS in Latex format
9. string. The optimal antiderivative in Latex format.
10. integer. 0 or 1. Indicates if problem has known antiderivative or not
11. String. The result (antiderivative) in CAS own syntax.
12. String. The grade of the antiderivative. Can be "A", "B", "C", or "F"
13. String. The optimal antiderivative in CAS own syntax.

High level overview of the CAS independent integration test build system

Chapter 2

detailed summary tables of results

2.1 List of integrals sorted by grade for each CAS

2.1.1 Rubi

A grade: { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 158, 159 }

B grade: { 97, 155, 156, 157 }

C grade: { }

F grade: { 111 }

2.1.2 Mathematica

A grade: { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 35, 36, 37, 38, 39, 40, 41, 42, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 55, 56, 57, 60, 61, 62, 63, 64, 65, 66, 67, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 98, 100, 101, 102, 103, 104, 105, 106, 109, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 133, 134, 135, 136, 137, 138, 142, 143, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 157, 158, 159 }

B grade: { 54, 97, 99, 107, 108, 110, 111, 155, 156 }

C grade: { 33, 34, 43, 58, 59, 68, 69, 70, 71, 72, 73, 74, 75, 76, 132 }

F grade: { 139, 140, 141, 144 }

2.1.3 Maple

A grade: { 1, 4, 5, 6, 7, 8, 9, 10, 11, 13, 15, 16, 17, 18, 19, 20, 21, 27, 28, 29, 30, 31, 32, 35, 36, 37, 38, 39, 44, 45, 46, 47, 48, 51, 52, 53, 55, 58, 60, 61, 62, 63, 65, 70, 88, 95, 102, 104, 109, 143 }

B grade: { 2, 3, 12, 14, 33, 34, 40, 41, 42, 43, 49, 50, 56, 57, 59, 66, 67, 68, 69, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 89, 90, 91, 92, 93, 94, 96, 97, 98, 99, 100, 101, 103, 105, 106, 107, 108, 110, 111, 119, 130, 131, 134, 135 }

C grade: { 22, 23, 24, 25, 26, 54, 64, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159 }

F grade: { 112, 113, 114, 115, 116, 117, 118, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 132, 133, 136, 137, 138, 139, 140, 141, 142, 144, 145, 146, 147, 148 }

2.1.4 Maxima

A grade: { 1, 2, 3, 4, 5, 6, 7, 31, 32, 143, 149, 150, 151, 152, 153, 154, 156, 157, 158, 159 }

B grade: { 155 }

C grade: { }

F grade: { 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 144, 145, 146, 147, 148 }

2.1.5 FriCAS

A grade: { 1, 2, 3, 6, 7, 8, 9, 10, 11, 12, 15, 16, 17, 18, 19, 22, 23, 24, 25, 27, 28, 29, 30, 31, 32, 143, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159 }

B grade: { 13, 14, 20, 21, 26, 119, 130, 131, 134, 135 }

C grade: { }

F grade: { 4, 5, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 132, 133, 136, 137, 138, 139, 140, 141, 142, 144, 145, 146, 147, 148 }

2.1.6 Sympy

A grade: { 1, 2, 6, 7, 8, 9, 10, 11, 12, 15, 16, 17, 18, 19, 119 }

B grade: { 3, 13, 20 }

C grade: { 22, 23, 24, 25, 26, 27, 28, 29, 30, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159 }

F grade: { 4, 5, 14, 21, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148 }

2.1.7 Giac

A grade: { 1, 2, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 31, 32, 143, 149, 150, 154, 155, 156, 157 }

B grade: { 27, 28, 29, 30, 119, 158, 159 }

C grade: { }

F grade: { 3, 4, 5, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 144, 145, 146, 147, 148, 151, 152, 153 }

2.2 Detailed conclusion table per each integral for all CAS systems

Detailed conclusion table per each integral is given by table below. The elapsed time is in seconds. For failed result it is given as F(-1) if the failure was due to timeout. It is given as F(-2) if the failure was due to an exception being raised, which could indicate a bug in the system. If the failure was due to integral not being evaluated within the time limit, then it is given just an F.

In this table, the column **normalized size** is defined as $\frac{\text{antiderivative leaf size}}{\text{optimal antiderivative leaf size}}$

Problem 1	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	112	112	112	109	146	379	148	203
normalized size	1	1.	1.	0.97	1.3	3.38	1.32	1.81
time (sec)	N/A	0.158	0.049	0.002	1.144	1.08	0.074	1.41

Problem 2	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	126	126	123	246	219	359	141	281
normalized size	1	1.	0.98	1.95	1.74	2.85	1.12	2.23
time (sec)	N/A	0.211	0.089	0.004	1.15	1.212	0.972	1.304

Problem 3	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	A	A	B	F(-2)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	84	84	85	196	140	242	507	0
normalized size	1	1.	1.01	2.33	1.67	2.88	6.04	0.
time (sec)	N/A	0.086	0.071	0.008	1.375	1.484	10.499	0.

Problem 4	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	F(-1)	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	108	108	102	179	181	0	0	0
normalized size	1	1.	0.94	1.66	1.68	0.	0.	0.
time (sec)	N/A	0.11	0.086	0.007	1.647	0.	0.	0.

Problem 5	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	F(-1)	F(-1)	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	163	163	164	164	419	0	0	0
normalized size	1	1.	1.01	1.01	2.57	0.	0.	0.
time (sec)	N/A	0.212	0.247	0.007	1.282	0.	0.	0.

Problem 6	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	23	23	23	20	26	66	20	30
normalized size	1	1.	1.	0.87	1.13	2.87	0.87	1.3
time (sec)	N/A	0.011	0.006	0.006	2.159	1.685	0.115	2.225

Problem 7	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	43	43	33	34	46	170	32	42
normalized size	1	1.	0.77	0.79	1.07	3.95	0.74	0.98
time (sec)	N/A	0.037	0.02	0.007	1.232	1.675	0.142	2.168

Problem 8	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F(-2)	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	227	227	205	301	0	1419	274	456
normalized size	1	1.	0.9	1.33	0.	6.25	1.21	2.01
time (sec)	N/A	0.257	0.264	0.008	0.	1.83	26.773	2.38

Problem 9	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F(-2)	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	146	146	145	176	0	914	167	271
normalized size	1	1.	0.99	1.21	0.	6.26	1.14	1.86
time (sec)	N/A	0.098	0.176	0.008	0.	1.838	18.801	1.734

Problem 10	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F(-2)	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	77	77	81	89	0	517	92	142
normalized size	1	1.	1.05	1.16	0.	6.71	1.19	1.84
time (sec)	N/A	0.024	0.15	0.006	0.	1.349	18.418	1.477

Problem 11	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F(-2)	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	54	54	55	46	0	279	54	77
normalized size	1	1.	1.02	0.85	0.	5.17	1.	1.43
time (sec)	N/A	0.017	0.046	0.008	0.	1.324	3.872	1.531

Problem 12	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F(-2)	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	101	101	101	196	0	1013	97	151
normalized size	1	1.	1.	1.94	0.	10.03	0.96	1.5
time (sec)	N/A	0.114	0.115	0.011	0.	1.693	17.092	1.436

Problem 13	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F(-2)	B	B	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	127	127	124	192	0	2114	1204	192
normalized size	1	1.	0.98	1.51	0.	16.65	9.48	1.51
time (sec)	N/A	0.109	0.468	0.013	0.	1.91	52.541	1.673

Problem 14	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F(-2)	B	F(-1)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	208	208	260	424	0	4552	0	405
normalized size	1	1.	1.25	2.04	0.	21.88	0.	1.95
time (sec)	N/A	0.274	0.636	0.016	0.	4.495	0.	1.745

Problem 15	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F(-2)	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	226	226	204	301	0	1419	274	456
normalized size	1	1.	0.9	1.33	0.	6.28	1.21	2.02
time (sec)	N/A	0.252	0.273	0.008	0.	1.427	26.157	2.56

Problem 16	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F(-2)	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	145	145	146	176	0	914	167	271
normalized size	1	1.	1.01	1.21	0.	6.3	1.15	1.87
time (sec)	N/A	0.094	0.163	0.007	0.	1.364	18.678	1.754

Problem 17	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F(-2)	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	77	77	87	89	0	517	92	142
normalized size	1	1.	1.13	1.16	0.	6.71	1.19	1.84
time (sec)	N/A	0.024	0.123	0.007	0.	1.226	18.186	2.756

Problem 18	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F(-2)	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	54	54	55	46	0	279	54	77
normalized size	1	1.	1.02	0.85	0.	5.17	1.	1.43
time (sec)	N/A	0.016	0.046	0.006	0.	1.293	3.901	2.643

Problem 19	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F(-2)	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	101	101	100	103	0	1013	100	151
normalized size	1	1.	0.99	1.02	0.	10.03	0.99	1.5
time (sec)	N/A	0.119	0.218	0.013	0.	1.647	15.252	2.624

Problem 20	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F(-2)	B	B	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	128	128	122	137	0	2118	1149	192
normalized size	1	1.	0.95	1.07	0.	16.55	8.98	1.5
time (sec)	N/A	0.116	0.191	0.016	0.	1.959	54.016	2.685

Problem 21	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F(-2)	B	F(-1)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	205	205	259	221	0	4551	0	406
normalized size	1	1.	1.26	1.08	0.	22.2	0.	1.98
time (sec)	N/A	0.279	0.55	0.014	0.	4.975	0.	1.829

Problem 22	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	A	C	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	111	111	89	132	0	165	484	85
normalized size	1	1.	0.8	1.19	0.	1.49	4.36	0.77
time (sec)	N/A	0.045	0.085	0.03	0.	1.263	25.737	1.779

Problem 23	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	A	C	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	87	87	81	111	0	146	393	72
normalized size	1	1.	0.93	1.28	0.	1.68	4.52	0.83
time (sec)	N/A	0.034	0.031	0.013	0.	1.379	18.821	2.59

Problem 24	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	A	C	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	63	63	73	90	0	124	269	54
normalized size	1	1.	1.16	1.43	0.	1.97	4.27	0.86
time (sec)	N/A	0.023	0.027	0.011	0.	1.319	14.384	2.491

Problem 25	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	A	C	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	37	37	61	70	0	100	133	38
normalized size	1	1.	1.65	1.89	0.	2.7	3.59	1.03
time (sec)	N/A	0.013	0.024	0.015	0.	1.303	7.767	2.546

Problem 26	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	B	C	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	29	29	53	69	0	111	71	59
normalized size	1	1.	1.83	2.38	0.	3.83	2.45	2.03
time (sec)	N/A	0.016	0.024	0.016	0.	1.314	10.317	2.979

Problem 27	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F(-2)	A	C	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	45	45	29	25	0	69	107	119
normalized size	1	1.	0.64	0.56	0.	1.53	2.38	2.64
time (sec)	N/A	0.01	0.012	0.003	0.	1.452	8.864	1.572

Problem 28	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F(-2)	A	C	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	73	73	37	33	0	85	189	176
normalized size	1	1.	0.51	0.45	0.	1.16	2.59	2.41
time (sec)	N/A	0.019	0.015	0.004	0.	1.499	12.744	1.869

Problem 29	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F(-2)	A	C	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	97	97	45	41	0	111	274	236
normalized size	1	1.	0.46	0.42	0.	1.14	2.82	2.43
time (sec)	N/A	0.027	0.017	0.003	0.	1.444	18.872	2.893

Problem 30	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F(-2)	A	C	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	121	121	53	49	0	131	359	293
normalized size	1	1.	0.44	0.4	0.	1.08	2.97	2.42
time (sec)	N/A	0.038	0.019	0.005	0.	1.401	29.943	2.93

Problem 31	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	F(-2)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	39	39	48	44	28	104	0	58
normalized size	1	1.	1.23	1.13	0.72	2.67	0.	1.49
time (sec)	N/A	0.007	0.015	0.015	3.19	1.324	0.	1.865

Problem 32	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	39	39	48	44	28	104	0	58
normalized size	1	1.	1.23	1.13	0.72	2.67	0.	1.49
time (sec)	N/A	0.011	0.006	0.004	1.766	1.328	0.	2.334

Problem 33	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	B	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	145	145	309	624	0	0	0	0
normalized size	1	1.	2.13	4.3	0.	0.	0.	0.
time (sec)	N/A	0.108	1.447	0.047	0.	0.	0.	0.

Problem 34	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	B	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	221	221	312	940	0	0	0	0
normalized size	1	1.	1.41	4.25	0.	0.	0.	0.
time (sec)	N/A	0.199	2.175	0.039	0.	0.	0.	0.

Problem 35	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	281	281	135	160	0	0	0	0
normalized size	1	1.	0.48	0.57	0.	0.	0.	0.
time (sec)	N/A	0.389	0.416	0.047	0.	0.	0.	0.

Problem 36	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	243	243	130	155	0	0	0	0
normalized size	1	1.	0.53	0.64	0.	0.	0.	0.
time (sec)	N/A	0.3	0.268	0.011	0.	0.	0.	0.

Problem 37	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	193	193	125	150	0	0	0	0
normalized size	1	1.	0.65	0.78	0.	0.	0.	0.
time (sec)	N/A	0.077	0.232	0.012	0.	0.	0.	0.

Problem 38	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	162	162	120	145	0	0	0	0
normalized size	1	1.	0.74	0.9	0.	0.	0.	0.
time (sec)	N/A	0.063	0.17	0.008	0.	0.	0.	0.

Problem 39	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	182	182	141	183	0	0	0	0
normalized size	1	1.	0.77	1.01	0.	0.	0.	0.
time (sec)	N/A	0.213	0.766	0.02	0.	0.	0.	0.

Problem 40	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	189	189	132	320	0	0	0	0
normalized size	1	1.	0.7	1.69	0.	0.	0.	0.
time (sec)	N/A	0.211	0.752	0.025	0.	0.	0.	0.

Problem 41	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	227	227	136	461	0	0	0	0
normalized size	1	1.	0.6	2.03	0.	0.	0.	0.
time (sec)	N/A	0.309	0.696	0.025	0.	0.	0.	0.

Problem 42	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	263	263	141	602	0	0	0	0
normalized size	1	1.	0.54	2.29	0.	0.	0.	0.
time (sec)	N/A	0.397	0.754	0.026	0.	0.	0.	0.

Problem 43	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	B	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	570	570	1250	3678	0	0	0	0
normalized size	1	1.	2.19	6.45	0.	0.	0.	0.
time (sec)	N/A	1.286	13.841	0.059	0.	0.	0.	0.

Problem 44	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	243	243	130	155	0	0	0	0
normalized size	1	1.	0.53	0.64	0.	0.	0.	0.
time (sec)	N/A	0.297	0.368	0.02	0.	0.	0.	0.

Problem 45	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	205	205	125	150	0	0	0	0
normalized size	1	1.	0.61	0.73	0.	0.	0.	0.
time (sec)	N/A	0.213	0.3	0.012	0.	0.	0.	0.

Problem 46	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	162	162	120	145	0	0	0	0
normalized size	1	1.	0.74	0.9	0.	0.	0.	0.
time (sec)	N/A	0.062	0.193	0.01	0.	0.	0.	0.

Problem 47	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	131	131	115	140	0	0	0	0
normalized size	1	1.	0.88	1.07	0.	0.	0.	0.
time (sec)	N/A	0.051	0.187	0.007	0.	0.	0.	0.

Problem 48	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	151	151	97	76	0	0	0	0
normalized size	1	1.	0.64	0.5	0.	0.	0.	0.
time (sec)	N/A	0.121	0.404	0.013	0.	0.	0.	0.

Problem 49	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	189	189	132	320	0	0	0	0
normalized size	1	1.	0.7	1.69	0.	0.	0.	0.
time (sec)	N/A	0.214	0.623	0.016	0.	0.	0.	0.

Problem 50	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	225	225	137	461	0	0	0	0
normalized size	1	1.	0.61	2.05	0.	0.	0.	0.
time (sec)	N/A	0.301	0.562	0.016	0.	0.	0.	0.

Problem 51	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	205	205	125	150	0	0	0	0
normalized size	1	1.	0.61	0.73	0.	0.	0.	0.
time (sec)	N/A	0.212	0.35	0.023	0.	0.	0.	0.

Problem 52	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	167	167	120	145	0	0	0	0
normalized size	1	1.	0.72	0.87	0.	0.	0.	0.
time (sec)	N/A	0.145	0.281	0.014	0.	0.	0.	0.

Problem 53	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	131	131	115	140	0	0	0	0
normalized size	1	1.	0.88	1.07	0.	0.	0.	0.
time (sec)	N/A	0.051	0.183	0.012	0.	0.	0.	0.

Problem 54	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	C	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	47	47	111	55	0	0	0	0
normalized size	1	1.	2.36	1.17	0.	0.	0.	0.
time (sec)	N/A	0.015	0.34	0.011	0.	0.	0.	0.

Problem 55	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	103	103	70	56	0	0	0	0
normalized size	1	1.	0.68	0.54	0.	0.	0.	0.
time (sec)	N/A	0.096	0.401	0.015	0.	0.	0.	0.

Problem 56	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	189	189	132	320	0	0	0	0
normalized size	1	1.	0.7	1.69	0.	0.	0.	0.
time (sec)	N/A	0.21	0.653	0.016	0.	0.	0.	0.

Problem 57	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	225	225	144	461	0	0	0	0
normalized size	1	1.	0.64	2.05	0.	0.	0.	0.
time (sec)	N/A	0.31	0.421	0.018	0.	0.	0.	0.

Problem 58	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	A	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	293	293	202	382	0	0	0	0
normalized size	1	1.	0.69	1.3	0.	0.	0.	0.
time (sec)	N/A	0.504	1.713	0.043	0.	0.	0.	0.

Problem 59	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	B	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	449	449	1195	968	0	0	0	0
normalized size	1	1.	2.66	2.16	0.	0.	0.	0.
time (sec)	N/A	0.672	8.35	0.024	0.	0.	0.	0.

Problem 60	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	203	203	125	150	0	0	0	0
normalized size	1	1.	0.62	0.74	0.	0.	0.	0.
time (sec)	N/A	0.216	0.497	0.024	0.	0.	0.	0.

Problem 61	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	165	165	120	145	0	0	0	0
normalized size	1	1.	0.73	0.88	0.	0.	0.	0.
time (sec)	N/A	0.153	0.347	0.017	0.	0.	0.	0.

Problem 62	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	129	129	115	140	0	0	0	0
normalized size	1	1.	0.89	1.09	0.	0.	0.	0.
time (sec)	N/A	0.063	0.239	0.017	0.	0.	0.	0.

Problem 63	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	98	98	187	57	0	0	0	0
normalized size	1	1.	1.91	0.58	0.	0.	0.	0.
time (sec)	N/A	0.037	0.452	0.015	0.	0.	0.	0.

Problem 64	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	48	48	79	36	0	0	0	0
normalized size	1	1.	1.65	0.75	0.	0.	0.	0.
time (sec)	N/A	0.014	0.109	0.013	0.	0.	0.	0.

Problem 65	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	51	51	99	37	0	0	0	0
normalized size	1	1.	1.94	0.73	0.	0.	0.	0.
time (sec)	N/A	0.07	0.468	0.016	0.	0.	0.	0.

Problem 66	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	189	189	132	320	0	0	0	0
normalized size	1	1.	0.7	1.69	0.	0.	0.	0.
time (sec)	N/A	0.22	0.634	0.019	0.	0.	0.	0.

Problem 67	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	225	225	147	461	0	0	0	0
normalized size	1	1.	0.65	2.05	0.	0.	0.	0.
time (sec)	N/A	0.31	0.439	0.02	0.	0.	0.	0.

Problem 68	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	B	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	137	137	180	552	0	0	0	0
normalized size	1	1.	1.31	4.03	0.	0.	0.	0.
time (sec)	N/A	0.061	0.586	0.022	0.	0.	0.	0.

Problem 69	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	B	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	284	284	319	559	0	0	0	0
normalized size	1	1.	1.12	1.97	0.	0.	0.	0.
time (sec)	N/A	0.169	1.911	0.033	0.	0.	0.	0.

Problem 70	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	A	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	165	165	225	223	0	0	0	0
normalized size	1	1.	1.36	1.35	0.	0.	0.	0.
time (sec)	N/A	0.374	1.365	0.026	0.	0.	0.	0.

Problem 71	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	B	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	393	393	321	2842	0	0	0	0
normalized size	1	1.	0.82	7.23	0.	0.	0.	0.
time (sec)	N/A	0.624	4.384	0.08	0.	0.	0.	0.

Problem 72	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	B	F	F(-1)	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	875	875	12191	17330	0	0	0	0
normalized size	1	1.	13.93	19.81	0.	0.	0.	0.
time (sec)	N/A	1.339	17.494	0.257	0.	0.	0.	0.

Problem 73	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	B	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	74	74	203	184	0	0	0	0
normalized size	1	1.	2.74	2.49	0.	0.	0.	0.
time (sec)	N/A	0.16	0.868	0.097	0.	0.	0.	0.

Problem 74	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	B	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	74	74	203	181	0	0	0	0
normalized size	1	1.	2.74	2.45	0.	0.	0.	0.
time (sec)	N/A	0.176	0.103	0.025	0.	0.	0.	0.

Problem 75	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	B	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	86	86	218	212	0	0	0	0
normalized size	1	1.	2.53	2.47	0.	0.	0.	0.
time (sec)	N/A	0.16	0.813	0.096	0.	0.	0.	0.

Problem 76	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	B	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	86	86	218	205	0	0	0	0
normalized size	1	1.	2.53	2.38	0.	0.	0.	0.
time (sec)	N/A	0.175	0.107	0.024	0.	0.	0.	0.

Problem 77	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	471	471	350	895	0	0	0	0
normalized size	1	1.	0.74	1.9	0.	0.	0.	0.
time (sec)	N/A	0.665	4.381	0.074	0.	0.	0.	0.

Problem 78	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	429	429	345	890	0	0	0	0
normalized size	1	1.	0.8	2.07	0.	0.	0.	0.
time (sec)	N/A	0.542	4.156	0.018	0.	0.	0.	0.

Problem 79	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	391	391	340	885	0	0	0	0
normalized size	1	1.	0.87	2.26	0.	0.	0.	0.
time (sec)	N/A	0.429	4.066	0.02	0.	0.	0.	0.

Problem 80	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	351	351	347	880	0	0	0	0
normalized size	1	1.	0.99	2.51	0.	0.	0.	0.
time (sec)	N/A	0.324	2.933	0.03	0.	0.	0.	0.

Problem 81	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	349	349	330	875	0	0	0	0
normalized size	1	1.	0.95	2.51	0.	0.	0.	0.
time (sec)	N/A	0.319	2.793	0.041	0.	0.	0.	0.

Problem 82	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	391	391	366	1149	0	0	0	0
normalized size	1	1.	0.94	2.94	0.	0.	0.	0.
time (sec)	N/A	0.429	2.974	0.04	0.	0.	0.	0.

Problem 83	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	330	330	251	973	0	0	0	0
normalized size	1	1.	0.76	2.95	0.	0.	0.	0.
time (sec)	N/A	0.395	2.258	0.042	0.	0.	0.	0.

Problem 84	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	370	370	259	1160	0	0	0	0
normalized size	1	1.	0.7	3.14	0.	0.	0.	0.
time (sec)	N/A	0.515	2.595	0.044	0.	0.	0.	0.

Problem 85	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	429	429	345	890	0	0	0	0
normalized size	1	1.	0.8	2.07	0.	0.	0.	0.
time (sec)	N/A	0.526	3.661	0.031	0.	0.	0.	0.

Problem 86	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	391	391	340	885	0	0	0	0
normalized size	1	1.	0.87	2.26	0.	0.	0.	0.
time (sec)	N/A	0.412	3.596	0.02	0.	0.	0.	0.

Problem 87	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	351	351	347	880	0	0	0	0
normalized size	1	1.	0.99	2.51	0.	0.	0.	0.
time (sec)	N/A	0.316	3.875	0.019	0.	0.	0.	0.

Problem 88	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	365	365	318	875	0	0	0	0
normalized size	1	1.	0.87	2.4	0.	0.	0.	0.
time (sec)	N/A	0.216	1.23	0.021	0.	0.	0.	0.

Problem 89	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	279	279	326	870	0	0	0	0
normalized size	1	1.	1.17	3.12	0.	0.	0.	0.
time (sec)	N/A	0.195	2.297	0.026	0.	0.	0.	0.

Problem 90	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	290	290	246	786	0	0	0	0
normalized size	1	1.	0.85	2.71	0.	0.	0.	0.
time (sec)	N/A	0.32	1.819	0.028	0.	0.	0.	0.

Problem 91	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	330	330	251	973	0	0	0	0
normalized size	1	1.	0.76	2.95	0.	0.	0.	0.
time (sec)	N/A	0.398	1.789	0.031	0.	0.	0.	0.

Problem 92	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	370	370	258	1160	0	0	0	0
normalized size	1	1.	0.7	3.14	0.	0.	0.	0.
time (sec)	N/A	0.521	2.196	0.031	0.	0.	0.	0.

Problem 93	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	391	391	340	885	0	0	0	0
normalized size	1	1.	0.87	2.26	0.	0.	0.	0.
time (sec)	N/A	0.421	2.445	0.036	0.	0.	0.	0.

Problem 94	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	351	351	349	880	0	0	0	0
normalized size	1	1.	0.99	2.51	0.	0.	0.	0.
time (sec)	N/A	0.322	3.148	0.024	0.	0.	0.	0.

Problem 95	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	365	365	347	875	0	0	0	0
normalized size	1	1.	0.95	2.4	0.	0.	0.	0.
time (sec)	N/A	0.202	1.369	0.023	0.	0.	0.	0.

Problem 96	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	101	101	170	172	0	0	0	0
normalized size	1	1.	1.68	1.7	0.	0.	0.	0.
time (sec)	N/A	0.037	0.546	0.025	0.	0.	0.	0.

Problem 97	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	B	B	B	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	60	195	237	330	0	0	0	0
normalized size	1	3.25	3.95	5.5	0.	0.	0.	0.
time (sec)	N/A	0.131	1.729	0.025	0.	0.	0.	0.

Problem 98	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	290	290	248	786	0	0	0	0
normalized size	1	1.	0.86	2.71	0.	0.	0.	0.
time (sec)	N/A	0.296	1.805	0.029	0.	0.	0.	0.

Problem 99	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	B	F	F(-1)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	721	721	6667	18077	0	0	0	0
normalized size	1	1.	9.25	25.07	0.	0.	0.	0.
time (sec)	N/A	0.675	15.126	0.151	0.	0.	0.	0.

Problem 100	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	161	208	206	4590	0	0	0	0
normalized size	1	1.29	1.28	28.51	0.	0.	0.	0.
time (sec)	N/A	0.093	4.707	0.118	0.	0.	0.	0.

Problem 101	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	351	351	347	880	0	0	0	0
normalized size	1	1.	0.99	2.51	0.	0.	0.	0.
time (sec)	N/A	0.319	2.431	0.037	0.	0.	0.	0.

Problem 102	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	469	469	347	875	0	0	0	0
normalized size	1	1.	0.74	1.87	0.	0.	0.	0.
time (sec)	N/A	0.28	1.223	0.023	0.	0.	0.	0.

Problem 103	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	100	100	95	170	0	0	0	0
normalized size	1	1.	0.95	1.7	0.	0.	0.	0.
time (sec)	N/A	0.038	0.158	0.021	0.	0.	0.	0.

Problem 104	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	71	71	90	134	0	0	0	0
normalized size	1	1.	1.27	1.89	0.	0.	0.	0.
time (sec)	N/A	0.043	0.139	0.022	0.	0.	0.	0.

Problem 105	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	195	270	237	599	0	0	0	0
normalized size	1	1.38	1.22	3.07	0.	0.	0.	0.
time (sec)	N/A	0.183	1.575	0.03	0.	0.	0.	0.

Problem 106	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	288	288	246	786	0	0	0	0
normalized size	1	1.	0.85	2.73	0.	0.	0.	0.
time (sec)	N/A	0.303	1.719	0.031	0.	0.	0.	0.

Problem 107	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	B	F	F(-1)	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	968	968	6638	16526	0	0	0	0
normalized size	1	1.	6.86	17.07	0.	0.	0.	0.
time (sec)	N/A	0.882	14.274	0.087	0.	0.	0.	0.

Problem 108	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	B	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	228	228	584	2465	0	0	0	0
normalized size	1	1.	2.56	10.81	0.	0.	0.	0.
time (sec)	N/A	0.15	5.571	0.053	0.	0.	0.	0.

Problem 109	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	161	198	227	270	0	0	0	0
normalized size	1	1.23	1.41	1.68	0.	0.	0.	0.
time (sec)	N/A	0.082	1.289	0.059	0.	0.	0.	0.

Problem 110	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	B	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	429	429	3247	4660	0	0	0	0
normalized size	1	1.	7.57	10.86	0.	0.	0.	0.
time (sec)	N/A	0.256	14.337	0.095	0.	0.	0.	0.

Problem 111	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	F	B	B	F	F	F(-1)	F
verified	N/A	N/A	NO	TBD	TBD	TBD	TBD	TBD
size	786	0	7061	21094	0	0	0	0
normalized size	1	0.	8.98	26.84	0.	0.	0.	0.
time (sec)	N/A	0.01	17.458	0.224	0.	0.	0.	0.

Problem 112	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	319	319	285	0	0	0	0	0
normalized size	1	1.	0.89	0.	0.	0.	0.	0.
time (sec)	N/A	0.279	1.322	0.089	0.	0.	0.	0.

Problem 113	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	216	216	174	0	0	0	0	0
normalized size	1	1.	0.81	0.	0.	0.	0.	0.
time (sec)	N/A	0.154	0.496	0.077	0.	0.	0.	0.

Problem 114	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	158	158	153	0	0	0	0	0
normalized size	1	1.	0.97	0.	0.	0.	0.	0.
time (sec)	N/A	0.107	0.074	0.069	0.	0.	0.	0.

Problem 115	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	124	124	116	0	0	0	0	0
normalized size	1	1.	0.94	0.	0.	0.	0.	0.
time (sec)	N/A	0.039	0.026	0.068	0.	0.	0.	0.

Problem 116	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	124	124	116	0	0	0	0	0
normalized size	1	1.	0.94	0.	0.	0.	0.	0.
time (sec)	N/A	0.033	0.03	0.063	0.	0.	0.	0.

Problem 117	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	175	175	170	0	0	0	0	0
normalized size	1	1.	0.97	0.	0.	0.	0.	0.
time (sec)	N/A	0.119	0.184	0.052	0.	0.	0.	0.

Problem 118	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	222	222	177	0	0	0	0	0
normalized size	1	1.	0.8	0.	0.	0.	0.	0.
time (sec)	N/A	0.151	0.267	0.082	0.	0.	0.	0.

Problem 119	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F(-2)	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	167	167	149	726	0	1847	8218	2248
normalized size	1	1.	0.89	4.35	0.	11.06	49.21	13.46
time (sec)	N/A	0.131	0.233	0.007	0.	1.607	7.096	2.658

Problem 120	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	134	134	120	0	0	0	0	0
normalized size	1	1.	0.9	0.	0.	0.	0.	0.
time (sec)	N/A	0.086	0.19	0.053	0.	0.	0.	0.

Problem 121	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	140	140	115	0	0	0	0	0
normalized size	1	1.	0.82	0.	0.	0.	0.	0.
time (sec)	N/A	0.059	0.094	0.066	0.	0.	0.	0.

Problem 122	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	224	224	193	0	0	0	0	0
normalized size	1	1.	0.86	0.	0.	0.	0.	0.
time (sec)	N/A	0.195	0.395	0.101	0.	0.	0.	0.

Problem 123	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	140	140	104	0	0	0	0	0
normalized size	1	1.	0.74	0.	0.	0.	0.	0.
time (sec)	N/A	0.123	0.217	0.066	0.	0.	0.	0.

Problem 124	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	266	266	195	0	0	0	0	0
normalized size	1	1.	0.73	0.	0.	0.	0.	0.
time (sec)	N/A	0.165	0.236	0.065	0.	0.	0.	0.

Problem 125	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	245	245	195	0	0	0	0	0
normalized size	1	1.	0.8	0.	0.	0.	0.	0.
time (sec)	N/A	0.155	0.261	0.061	0.	0.	0.	0.

Problem 126	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	235	235	189	0	0	0	0	0
normalized size	1	1.	0.8	0.	0.	0.	0.	0.
time (sec)	N/A	0.138	0.206	0.061	0.	0.	0.	0.

Problem 127	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	261	261	221	0	0	0	0	0
normalized size	1	1.	0.85	0.	0.	0.	0.	0.
time (sec)	N/A	0.186	0.186	0.056	0.	0.	0.	0.

Problem 128	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	203	205	198	0	0	0	0	0
normalized size	1	1.01	0.98	0.	0.	0.	0.	0.
time (sec)	N/A	0.107	0.249	0.054	0.	0.	0.	0.

Problem 129	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	246	246	237	0	0	0	0	0
normalized size	1	1.	0.96	0.	0.	0.	0.	0.
time (sec)	N/A	0.16	0.331	0.052	0.	0.	0.	0.

Problem 130	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	B	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	362	362	220	894	0	3309	0	0
normalized size	1	1.	0.61	2.47	0.	9.14	0.	0.
time (sec)	N/A	0.362	0.55	0.008	0.	1.46	0.	0.

Problem 131	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	B	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	507	507	279	2343	0	6969	0	0
normalized size	1	1.	0.55	4.62	0.	13.75	0.	0.
time (sec)	N/A	0.586	0.769	0.01	0.	1.971	0.	0.

Problem 132	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	F	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	815	803	3579	0	0	0	0	0
normalized size	1	0.99	4.39	0.	0.	0.	0.	0.
time (sec)	N/A	1.435	48.597	0.063	0.	0.	0.	0.

Problem 133	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	572	566	422	0	0	0	0	0
normalized size	1	0.99	0.74	0.	0.	0.	0.	0.
time (sec)	N/A	0.662	1.816	0.059	0.	0.	0.	0.

Problem 134	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	B	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	363	360	227	906	0	3272	0	0
normalized size	1	0.99	0.63	2.5	0.	9.01	0.	0.
time (sec)	N/A	0.397	0.573	0.008	0.	1.604	0.	0.

Problem 135	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	B	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	188	186	182	509	0	1805	0	0
normalized size	1	0.99	0.97	2.71	0.	9.6	0.	0.
time (sec)	N/A	0.098	0.119	0.008	0.	1.505	0.	0.

Problem 136	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F(-1)	F
verified	N/A	NO	NO	TBD	TBD	TBD	TBD	TBD
size	177	190	199	0	0	0	0	0
normalized size	1	1.07	1.12	0.	0.	0.	0.	0.
time (sec)	N/A	0.119	0.399	0.071	0.	0.	0.	0.

Problem 137	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	233	220	174	0	0	0	0	0
normalized size	1	0.94	0.75	0.	0.	0.	0.	0.
time (sec)	N/A	0.127	0.137	0.068	0.	0.	0.	0.

Problem 138	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	250	250	184	0	0	0	0	0
normalized size	1	1.	0.74	0.	0.	0.	0.	0.
time (sec)	N/A	0.217	0.208	0.059	0.	0.	0.	0.

Problem 139	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	F	F	F	F	F(-1)	F(-1)
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	530	530	0	0	0	0	0	0
normalized size	1	1.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	1.179	4.524	0.25	0.	0.	0.	0.

Problem 140	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	F	F	F	F	F(-1)	F(-1)
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	393	393	0	0	0	0	0	0
normalized size	1	1.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.493	1.486	0.173	0.	0.	0.	0.

Problem 141	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	F	F	F	F	F(-1)	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	256	256	0	0	0	0	0	0
normalized size	1	1.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.21	0.905	0.148	0.	0.	0.	0.

Problem 142	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	123	123	121	0	0	0	0	0
normalized size	1	1.	0.98	0.	0.	0.	0.	0.
time (sec)	N/A	0.083	0.134	0.002	0.	0.	0.	0.

Problem 143	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	31	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.008	0.254	0.157	0.	0.	0.	0.

Problem 144	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	F	F	F	F	F(-1)	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	268	268	0	0	0	0	0	0
normalized size	1	1.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.212	0.637	0.151	0.	0.	0.	0.

Problem 145	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	283	283	208	0	0	0	0	0
normalized size	1	1.	0.73	0.	0.	0.	0.	0.
time (sec)	N/A	0.208	0.32	0.145	0.	0.	0.	0.

Problem 146	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	277	277	215	0	0	0	0	0
normalized size	1	1.	0.78	0.	0.	0.	0.	0.
time (sec)	N/A	0.147	0.443	0.143	0.	0.	0.	0.

Problem 147	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	263	261	223	0	0	0	0	0
normalized size	1	0.99	0.85	0.	0.	0.	0.	0.
time (sec)	N/A	0.227	0.315	0.151	0.	0.	0.	0.

Problem 148	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	558	558	508	0	0	0	0	0
normalized size	1	1.	0.91	0.	0.	0.	0.	0.
time (sec)	N/A	0.981	1.872	0.152	0.	0.	0.	0.

Problem 149	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	C	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	79	79	57	139	134	189	313	123
normalized size	1	1.	0.72	1.76	1.7	2.39	3.96	1.56
time (sec)	N/A	0.142	0.062	0.038	3.068	1.047	46.125	2.052

Problem 150	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	C	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	63	63	45	117	105	167	282	97
normalized size	1	1.	0.71	1.86	1.67	2.65	4.48	1.54
time (sec)	N/A	0.061	0.031	0.015	4.261	1.043	21.009	2.571

Problem 151	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	C	F(-2)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	48	48	48	96	89	196	245	0
normalized size	1	1.	1.	2.	1.85	4.08	5.1	0.
time (sec)	N/A	0.184	0.05	0.024	3.423	1.142	27.867	0.

Problem 152	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	C	F(-2)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	48	48	48	97	89	201	221	0
normalized size	1	1.	1.	2.02	1.85	4.19	4.6	0.
time (sec)	N/A	0.183	0.055	0.02	3.045	1.149	27.566	0.

Problem 153	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	C	F(-2)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	71	71	56	108	132	154	218	0
normalized size	1	1.	0.79	1.52	1.86	2.17	3.07	0.
time (sec)	N/A	0.188	0.047	0.019	2.734	1.049	34.59	0.

Problem 154	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	C	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	87	151	149	137	147	176	308	130
normalized size	1	1.74	1.71	1.57	1.69	2.02	3.54	1.49
time (sec)	N/A	0.146	0.331	0.023	1.352	1.052	44.788	2.124

Problem 155	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	B	B	C	B	A	C	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	52	135	126	120	142	150	277	104
normalized size	1	2.6	2.42	2.31	2.73	2.88	5.33	2.
time (sec)	N/A	0.071	0.21	0.016	1.36	1.102	20.739	2.571

Problem 156	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	B	B	C	A	A	C	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	55	135	128	95	86	184	240	96
normalized size	1	2.45	2.33	1.73	1.56	3.35	4.36	1.75
time (sec)	N/A	0.184	0.399	0.019	3.912	1.086	26.248	1.986

Problem 157	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	B	A	C	A	A	C	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	55	135	89	96	86	203	216	112
normalized size	1	2.45	1.62	1.75	1.56	3.69	3.93	2.04
time (sec)	N/A	0.182	0.167	0.017	2.016	1.143	27.925	2.665

Problem 158	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	C	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	83	129	82	103	88	173	212	196
normalized size	1	1.55	0.99	1.24	1.06	2.08	2.55	2.36
time (sec)	N/A	0.189	0.121	0.018	2.21	1.057	34.178	1.469

Problem 159	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	C	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	116	171	94	123	119	216	219	266
normalized size	1	1.47	0.81	1.06	1.03	1.86	1.89	2.29
time (sec)	N/A	0.221	0.116	0.019	1.794	1.032	56.645	1.69

2.3 Detailed conclusion table specific for Rubi results

The following table is specific to Rubi. It gives additional statistics for each integral. the column **steps** is the number of steps used by Rubi to obtain the antiderivative. The **rules** column is the number of unique rules used. The **integrand size** column is the leaf size of the integrand. Finally the ratio $\frac{\text{number of rules}}{\text{integrand size}}$ is given. The larger this ratio is, the harder the integral was to solve. In this test, problem number [72] had the largest ratio of [0.3429]

Table 2.1: Rubi specific breakdown of results for each integral

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
1	A	2	1	1.	21	0.048
2	A	2	1	1.	23	0.043
3	A	2	1	1.	25	0.04
4	A	2	1	1.	27	0.037
5	A	2	1	1.	29	0.034
6	A	2	1	1.	17	0.059
7	A	3	2	1.	22	0.091
8	A	6	5	1.	25	0.2
9	A	5	5	1.	25	0.2
10	A	4	4	1.	23	0.174
11	A	4	4	1.	18	0.222
12	A	6	4	1.	25	0.16
13	A	6	4	1.	25	0.16
14	A	7	5	1.	25	0.2
15	A	6	5	1.	25	0.2
16	A	5	5	1.	25	0.2
17	A	4	4	1.	23	0.174
18	A	4	4	1.	18	0.222
19	A	6	5	1.	25	0.2
20	A	6	5	1.	25	0.2
21	A	7	6	1.	25	0.24
22	A	8	6	1.	26	0.231
23	A	7	6	1.	26	0.231
24	A	6	6	1.	24	0.25
25	A	4	4	1.	23	0.174
26	A	5	5	1.	26	0.192
27	A	3	3	1.	26	0.115
28	A	4	4	1.	26	0.154
29	A	5	4	1.	26	0.154
30	A	6	4	1.	26	0.154
31	A	4	4	1.	24	0.167

Continued on next page

Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
32	A	5	5	1.	36	0.139
33	A	3	3	1.	45	0.067
34	A	5	5	1.	39	0.128
35	A	10	8	1.	35	0.229
36	A	9	8	1.	35	0.229
37	A	8	6	1.	33	0.182
38	A	7	7	1.	28	0.25
39	A	10	10	1.	35	0.286
40	A	10	10	1.	35	0.286
41	A	11	11	1.	35	0.314
42	A	12	11	1.	35	0.314
43	A	12	10	1.	35	0.286
44	A	9	8	1.	35	0.229
45	A	8	8	1.	35	0.229
46	A	7	6	1.	33	0.182
47	A	6	6	1.	28	0.214
48	A	9	9	1.	35	0.257
49	A	10	10	1.	35	0.286
50	A	11	11	1.	35	0.314
51	A	8	8	1.	35	0.229
52	A	7	7	1.	35	0.2
53	A	6	6	1.	33	0.182
54	A	2	2	1.	28	0.071
55	A	6	6	1.	35	0.171
56	A	10	10	1.	35	0.286
57	A	11	11	1.	35	0.314
58	A	8	6	1.	35	0.171
59	A	11	8	1.	35	0.229
60	A	8	8	1.	35	0.229
61	A	7	7	1.	35	0.2
62	A	7	7	1.	35	0.2
63	A	5	5	1.	33	0.152

Continued on next page

Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
64	A	2	2	1.	28	0.071
65	A	3	3	1.	35	0.086
66	A	10	10	1.	35	0.286
67	A	11	11	1.	35	0.314
68	A	3	3	1.	36	0.083
69	A	6	5	1.	33	0.152
70	A	4	3	1.	35	0.086
71	A	10	8	1.	35	0.229
72	A	18	12	1.	35	0.343
73	A	3	3	1.	36	0.083
74	A	4	4	1.	31	0.129
75	A	3	3	1.	40	0.075
76	A	4	4	1.	31	0.129
77	A	12	10	1.	37	0.27
78	A	11	10	1.	37	0.27
79	A	10	10	1.	37	0.27
80	A	9	9	1.	37	0.243
81	A	9	9	1.	37	0.243
82	A	10	10	1.	37	0.27
83	A	9	9	1.	37	0.243
84	A	10	9	1.	37	0.243
85	A	11	10	1.	37	0.27
86	A	10	10	1.	37	0.27
87	A	9	9	1.	37	0.243
88	A	9	8	1.	37	0.216
89	A	7	7	1.	37	0.189
90	A	8	8	1.	37	0.216
91	A	9	9	1.	37	0.243
92	A	10	9	1.	37	0.243
93	A	10	10	1.	37	0.27
94	A	9	9	1.	37	0.243
95	A	9	8	1.	37	0.216

Continued on next page

Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
96	A	2	2	1.	37	0.054
97	B	5	5	3.25	37	0.135
98	A	8	8	1.	37	0.216
99	A	7	7	1.	37	0.189
100	A	2	2	1.29	37	0.054
101	A	9	9	1.	37	0.243
102	A	12	10	1.	37	0.27
103	A	2	2	1.	37	0.054
104	A	2	2	1.	37	0.054
105	A	8	7	1.38	37	0.189
106	A	8	8	1.	37	0.216
107	A	10	8	1.	37	0.216
108	A	2	2	1.	37	0.054
109	A	2	2	1.23	37	0.054
110	A	5	5	1.	37	0.135
111	F	0	0	N/A	0	N/A
112	A	8	3	1.	25	0.12
113	A	6	3	1.	25	0.12
114	A	4	2	1.	25	0.08
115	A	3	2	1.	23	0.087
116	A	3	2	1.	22	0.091
117	A	5	3	1.	25	0.12
118	A	6	3	1.	25	0.12
119	A	2	1	1.	23	0.043
120	A	2	2	1.	25	0.08
121	A	3	2	1.	27	0.074
122	A	5	2	1.	29	0.069
123	A	6	3	1.	25	0.12
124	A	3	3	1.	25	0.12
125	A	3	3	1.	29	0.103
126	A	3	3	1.	27	0.111
127	A	3	3	1.	29	0.103

Continued on next page

Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
128	A	3	3	1.01	29	0.103
129	A	3	3	1.	29	0.103
130	A	3	3	1.	29	0.103
131	A	4	3	1.	29	0.103
132	A	10	9	0.99	31	0.29
133	A	9	8	0.99	31	0.258
134	A	3	3	0.99	29	0.103
135	A	3	3	0.99	24	0.125
136	A	5	5	1.07	27	0.185
137	A	7	5	0.94	29	0.172
138	A	7	4	1.	29	0.138
139	A	31	5	1.	29	0.172
140	A	15	5	1.	29	0.172
141	A	7	4	1.	27	0.148
142	A	3	3	1.	22	0.136
143	A	0	0	0.	0	0.
144	A	7	4	1.	33	0.121
145	A	7	4	1.	34	0.118
146	A	5	5	1.	34	0.147
147	A	3	3	0.99	34	0.088
148	A	4	3	1.	34	0.088
149	A	4	4	1.	31	0.129
150	A	4	4	1.	30	0.133
151	A	7	7	1.	33	0.212
152	A	7	7	1.	33	0.212
153	A	6	6	1.	33	0.182
154	A	5	5	1.74	30	0.167
155	B	5	5	2.6	29	0.172
156	B	8	8	2.45	32	0.25
157	B	8	8	2.45	32	0.25
158	A	6	6	1.55	32	0.188
159	A	7	7	1.47	32	0.219

Chapter 3

Listing of integrals

3.1 $\int (a + bx)(c + dx)(e + fx)(g + hx) dx$

Optimal. Leaf size=112

$$\frac{1}{4}x^4(adfh + b(cf h + deh + dfg)) + \frac{1}{3}x^3(a(cf h + deh + dfg) + b(ceh + cfg + deg)) + \frac{1}{2}x^2(a(ceh + cfg + deg) + bceg) +$$

[Out] $a*c*e*g*x + ((b*c*e*g + a*(d*e*g + c*f*g + c*e*h))*x^2)/2 + ((b*(d*e*g + c*f*g + c*e*h) + a*(d*f*g + d*e*h + c*f*h))*x^3)/3 + ((a*d*f*h + b*(d*f*g + d*e*h + c*f*h))*x^4)/4 + (b*d*f*h*x^5)/5$

Rubi [A] time = 0.157949, antiderivative size = 112, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.048$, Rules used = {142}

$$\frac{1}{4}x^4(adfh + b(cf h + deh + dfg)) + \frac{1}{3}x^3(a(cf h + deh + dfg) + b(ceh + cfg + deg)) + \frac{1}{2}x^2(a(ceh + cfg + deg) + bceg) +$$

Antiderivative was successfully verified.

[In] Int[(a + b*x)*(c + d*x)*(e + f*x)*(g + h*x),x]

[Out] $a*c*e*g*x + ((b*c*e*g + a*(d*e*g + c*f*g + c*e*h))*x^2)/2 + ((b*(d*e*g + c*f*g + c*e*h) + a*(d*f*g + d*e*h + c*f*h))*x^3)/3 + ((a*d*f*h + b*(d*f*g + d*e*h + c*f*h))*x^4)/4 + (b*d*f*h*x^5)/5$

Rule 142

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))
*((g_.) + (h_.)*(x_)), x_Symbol] := Int[ExpandIntegrand[(a + b*x)^m*(c +
d*x)^n*(e + f*x)*(g + h*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x] &&
(IGtQ[m, 0] || IntegersQ[m, n])
```

Rubi steps

$$\int (a + bx)(c + dx)(e + fx)(g + hx) dx = \int (aceg + (bceg + a(deg + cfg + ce h))x + (b(deg + cfg + ce h) + a(df g + deh + bdf g))x^2 + \frac{1}{2}(bceg + a(deg + cfg + ce h))x^2 + \frac{1}{3}(b(deg + cfg + ce h) + a(df g + deh + bdf g))x^3 + \frac{1}{4}(aceg + a(df g + deh + bdf g))x^4) dx$$

Mathematica [A] time = 0.0493336, size = 112, normalized size = 1.

$$\frac{1}{4}x^4(adfh + bcfh + bdeh + bdfg) + \frac{1}{3}x^3(acfh + adeh + adfg + bceh + bcfg + bdeg) + \frac{1}{2}x^2(aceh + acfg + adeg + bceg) + \frac{1}{4}x(aceg + a(df g + deh + bdf g)) + \frac{1}{4}aceg$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x)*(c + d*x)*(e + f*x)*(g + h*x), x]
```

```
[Out] a*c*e*g*x + ((b*c*e*g + a*d*e*g + a*c*f*g + a*c*e*h)*x^2)/2 + ((b*d*e*g + b
*c*f*g + a*d*f*g + b*c*e*h + a*d*e*h + a*c*f*h)*x^3)/3 + ((b*d*f*g + b*d*e*
h + b*c*f*h + a*d*f*h)*x^4)/4 + (b*d*f*h*x^5)/5
```

Maple [A] time = 0.002, size = 109, normalized size = 1.

$$\frac{bdfhx^5}{5} + \frac{((ad + bc)f + bde)h + bdfg}{4}x^4 + \frac{((acf + (ad + bc)e)h + ((ad + bc)f + bde)g)x^3}{3} + \frac{(aceh + (acf + (ad + bc)e)g)x^2}{2} + \frac{aceg}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x+a)*(d*x+c)*(f*x+e)*(h*x+g), x)
```

```
[Out] 1/5*b*d*f*h*x^5+1/4*(((a*d+b*c)*f+b*d*e)*h+b*d*f*g)*x^4+1/3*((a*c*f+(a*d+b*
c)*e)*h+((a*d+b*c)*f+b*d*e)*g)*x^3+1/2*(a*c*e*h+(a*c*f+(a*d+b*c)*e)*g)*x^2+
a*c*e*g*x
```

Maxima [A] time = 1.14432, size = 146, normalized size = 1.3

$$\frac{1}{5} bdfhx^5 + acegx + \frac{1}{4} (bdfg + (bde + (bc + ad)f)h)x^4 + \frac{1}{3} ((bde + (bc + ad)f)g + (acf + (bc + ad)e)h)x^3 + \frac{1}{2} (aceh +$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b*x+a)*(d*x+c)*(f*x+e)*(h*x+g),x, algorithm="maxima")

[Out] 1/5*b*d*f*h*x^5 + a*c*e*g*x + 1/4*(b*d*f*g + (b*d*e + (b*c + a*d)*f)*h)*x^4 + 1/3*((b*d*e + (b*c + a*d)*f)*g + (a*c*f + (b*c + a*d)*e)*h)*x^3 + 1/2*(a*c*e*h + (a*c*f + (b*c + a*d)*e)*g)*x^2

Fricas [A] time = 1.08041, size = 379, normalized size = 3.38

$$\frac{1}{5}x^5hfdb + \frac{1}{4}x^4gfdb + \frac{1}{4}x^4hedb + \frac{1}{4}x^4hfc b + \frac{1}{4}x^4hfda + \frac{1}{3}x^3gedb + \frac{1}{3}x^3gfc b + \frac{1}{3}x^3hecb + \frac{1}{3}x^3gfda + \frac{1}{3}x^3heda + \frac{1}{3}x^3$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b*x+a)*(d*x+c)*(f*x+e)*(h*x+g),x, algorithm="fricas")

[Out] 1/5*x^5*h*f*d*b + 1/4*x^4*g*f*d*b + 1/4*x^4*h*e*d*b + 1/4*x^4*h*f*c*b + 1/4*x^4*h*f*d*a + 1/3*x^3*g*e*d*b + 1/3*x^3*g*f*c*b + 1/3*x^3*h*e*c*b + 1/3*x^3*g*f*d*a + 1/3*x^3*h*e*d*a + 1/3*x^3*h*f*c*a + 1/2*x^2*g*e*c*b + 1/2*x^2*g*e*d*a + 1/2*x^2*g*f*c*a + 1/2*x^2*h*e*c*a + x*g*e*c*a

Sympy [A] time = 0.074263, size = 148, normalized size = 1.32

$$acegx + \frac{bdfhx^5}{5} + x^4 \left(\frac{adfh}{4} + \frac{bcfh}{4} + \frac{bdeh}{4} + \frac{bdfg}{4} \right) + x^3 \left(\frac{acfh}{3} + \frac{adeh}{3} + \frac{adfg}{3} + \frac{bceh}{3} + \frac{bcfg}{3} + \frac{bdeg}{3} \right) + x^2 \left(\frac{aceh}{2} + \right.$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b*x+a)*(d*x+c)*(f*x+e)*(h*x+g),x)

[Out] a*c*e*g*x + b*d*f*h*x**5/5 + x**4*(a*d*f*h/4 + b*c*f*h/4 + b*d*e*h/4 + b*d*f*g/4) + x**3*(a*c*f*h/3 + a*d*e*h/3 + a*d*f*g/3 + b*c*e*h/3 + b*c*f*g/3 + b*d*e*g/3) + x**2*(a*c*e*h/2 + a*c*f*g/2 + a*d*e*g/2 + b*c*e*g/2)

Giac [A] time = 1.41033, size = 203, normalized size = 1.81

$$\frac{1}{5} bdfhx^5 + \frac{1}{4} bdfgx^4 + \frac{1}{4} bcfhx^4 + \frac{1}{4} adfhx^4 + \frac{1}{4} bdhx^4e + \frac{1}{3} bcfgx^3 + \frac{1}{3} adfgx^3 + \frac{1}{3} acfhx^3 + \frac{1}{3} bdgx^3e + \frac{1}{3} bchx^3e +$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b*x+a)*(d*x+c)*(f*x+e)*(h*x+g),x, algorithm="giac")

[Out] 1/5*b*d*f*h*x^5 + 1/4*b*d*f*g*x^4 + 1/4*b*c*f*h*x^4 + 1/4*a*d*f*h*x^4 + 1/4*b*d*h*x^4*e + 1/3*b*c*f*g*x^3 + 1/3*a*d*f*g*x^3 + 1/3*a*c*f*h*x^3 + 1/3*b*d*g*x^3*e + 1/3*b*c*h*x^3*e + 1/3*a*d*h*x^3*e + 1/2*a*c*f*g*x^2 + 1/2*b*c*g*x^2*e + 1/2*a*d*g*x^2*e + 1/2*a*c*h*x^2*e + a*c*g*x*e

$$3.2 \quad \int \frac{(a+bx)(c+dx)(e+fx)}{g+hx} dx$$

Optimal. Leaf size=126

$$\frac{x^2(adfh - b(-cfh - deh + dfg))}{2h^2} + \frac{x(b(dg - ch)(fg - eh) - ah(-cfh - deh + dfg))}{h^3} - \frac{(bg - ah)(dg - ch)(fg - eh) \log(g + hx)}{h^4}$$

[Out] $((b*(d*g - c*h)*(f*g - e*h) - a*h*(d*f*g - d*e*h - c*f*h))*x)/h^3 + ((a*d*f*h - b*(d*f*g - d*e*h - c*f*h))*x^2)/(2*h^2) + (b*d*f*x^3)/(3*h) - ((b*g - a*h)*(d*g - c*h)*(f*g - e*h)*\text{Log}[g + h*x])/h^4$

Rubi [A] time = 0.211189, antiderivative size = 126, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.043$, Rules used = {142}

$$\frac{x^2(adfh - b(-cfh - deh + dfg))}{2h^2} + \frac{x(b(dg - ch)(fg - eh) - ah(-cfh - deh + dfg))}{h^3} - \frac{(bg - ah)(dg - ch)(fg - eh) \log(g + hx)}{h^4}$$

Antiderivative was successfully verified.

[In] $\text{Int}[(a + b*x)*(c + d*x)*(e + f*x)/(g + h*x), x]$

[Out] $((b*(d*g - c*h)*(f*g - e*h) - a*h*(d*f*g - d*e*h - c*f*h))*x)/h^3 + ((a*d*f*h - b*(d*f*g - d*e*h - c*f*h))*x^2)/(2*h^2) + (b*d*f*x^3)/(3*h) - ((b*g - a*h)*(d*g - c*h)*(f*g - e*h)*\text{Log}[g + h*x])/h^4$

Rule 142

$\text{Int}[(a_. + (b_.)*(x_.))^(m_.)*((c_.) + (d_.)*(x_.))^(n_.)*((e_.) + (f_.)*(x_.))*(g_. + (h_.)*(x_.)), x_Symbol] \rightarrow \text{Int}[\text{ExpandIntegrand}[(a + b*x)^m*(c + d*x)^n*(e + f*x)*(g + h*x), x], x] /; \text{FreeQ}\{a, b, c, d, e, f, g, h\}, x] \&\& (\text{IGtQ}[m, 0] \parallel \text{IntegersQ}[m, n])$

Rubi steps

$$\int \frac{(a+bx)(c+dx)(e+fx)}{g+hx} dx = \int \left(\frac{b(dg - ch)(fg - eh) - ah(dfg - deh - cfh)}{h^3} + \frac{(adfh - b(dfg - deh - cfh))x}{h^2} + \frac{bd}{h} \right) dx$$

$$= \frac{(b(dg - ch)(fg - eh) - ah(dfg - deh - cfh))x}{h^3} + \frac{(adfh - b(dfg - deh - cfh))x^2}{2h^2} + \frac{bd}{3h} + \frac{c}{3}$$

Mathematica [A] time = 0.0894686, size = 123, normalized size = 0.98

$$\frac{hx(3ah(2cfh + d(2eh - 2fg + fhx)) + b(3ch(2eh - 2fg + fhx) + 3deh(hx - 2g) + df(6g^2 - 3ghx + 2h^2x^2))) - 6(bg - a)}{6h^4}$$

Antiderivative was successfully verified.

[In] Integrate[((a + b*x)*(c + d*x)*(e + f*x))/(g + h*x), x]

[Out] (h*x*(3*a*h*(2*c*f*h + d*(-2*f*g + 2*e*h + f*h*x)) + b*(3*d*e*h*(-2*g + h*x) + 3*c*h*(-2*f*g + 2*e*h + f*h*x) + d*f*(6*g^2 - 3*g*h*x + 2*h^2*x^2))) - 6*(b*g - a*h)*(d*g - c*h)*(f*g - e*h)*Log[g + h*x])/(6*h^4)

Maple [B] time = 0.004, size = 246, normalized size = 2.

$$\frac{bdfx^3}{3h} + \frac{x^2adf}{2h} + \frac{x^2bcf}{2h} + \frac{dx^2be}{2h} - \frac{dx^2bfg}{2h^2} + \frac{acfx}{h} + \frac{adex}{h} - \frac{adfgx}{h^2} + \frac{bcex}{h} - \frac{bcfgx}{h^2} - \frac{bdegx}{h^2} + \frac{bdfg^2x}{h^3} + \frac{\ln(hx + g)}{h}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b*x+a)*(d*x+c)*(f*x+e)/(h*x+g), x)

[Out] 1/3*b*d*f*x^3/h+1/2/h*x^2*a*d*f+1/2/h*x^2*b*c*f+1/2/h*x^2*b*d*e-1/2/h^2*x^2*b*d*f*g+1/h*a*c*f*x+1/h*a*d*e*x-1/h^2*a*d*f*g*x+1/h*b*c*e*x-1/h^2*b*c*f*g*x-1/h^2*b*d*e*g*x+1/h^3*b*d*f*g^2*x+1/h*ln(h*x+g)*a*c*e-1/h^2*ln(h*x+g)*a*c*f*g-1/h^2*ln(h*x+g)*a*d*e*g+1/h^3*ln(h*x+g)*a*d*f*g^2-1/h^2*ln(h*x+g)*b*c*e*g+1/h^3*ln(h*x+g)*b*c*f*g^2+1/h^3*ln(h*x+g)*b*d*e*g^2-1/h^4*ln(h*x+g)*b*d*f*g^3

Maxima [A] time = 1.15018, size = 219, normalized size = 1.74

$$\frac{2bdfh^2x^3 - 3(bdfgh - (bde + (bc + ad)f)h^2)x^2 + 6(bdfg^2 - (bde + (bc + ad)f)gh + (acf + (bc + ad)e)h^2)x - (bdfg^3 - (bde + (bc + ad)f)g^2 + (acf + (bc + ad)e)g)h^2)}{6h^3}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b*x+a)*(d*x+c)*(f*x+e)/(h*x+g), x, algorithm="maxima")

[Out] 1/6*(2*b*d*f*h^2*x^3 - 3*(b*d*f*g*h - (b*d*e + (b*c + a*d)*f)*h^2)*x^2 + 6*(b*d*f*g^2 - (b*d*e + (b*c + a*d)*f)*g*h + (a*c*f + (b*c + a*d)*e)*h^2)*x)/

$$h^3 - (b*d*f*g^3 - a*c*e*h^3 - (b*d*e + (b*c + a*d)*f)*g^2*h + (a*c*f + (b*c + a*d)*e)*g*h^2)*\log(h*x + g)/h^4$$

Fricas [A] time = 1.21161, size = 359, normalized size = 2.85

$$\frac{2bdfh^3x^3 - 3(bdfgh^2 - (bde + (bc + ad)f)h^3)x^2 + 6(bdfg^2h - (bde + (bc + ad)f)gh^2 + (acf + (bc + ad)e)h^3)x - 6(bd*f*g^3 - a*c*e*h^3 - (b*d*e + (b*c + a*d)*f)*g^2*h + (a*c*f + (b*c + a*d)*e)*g*h^2)*\log(h*x + g)}{6h^4}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b*x+a)*(d*x+c)*(f*x+e)/(h*x+g),x, algorithm="fricas")

[Out] 1/6*(2*b*d*f*h^3*x^3 - 3*(b*d*f*g*h^2 - (b*d*e + (b*c + a*d)*f)*h^3)*x^2 + 6*(b*d*f*g^2*h - (b*d*e + (b*c + a*d)*f)*g*h^2 + (a*c*f + (b*c + a*d)*e)*h^3)*x - 6*(b*d*f*g^3 - a*c*e*h^3 - (b*d*e + (b*c + a*d)*f)*g^2*h + (a*c*f + (b*c + a*d)*e)*g*h^2)*log(h*x + g)/h^4

Sympy [A] time = 0.972131, size = 141, normalized size = 1.12

$$\frac{bdfx^3}{3h} + \frac{x^2(adfh + bcfh + bdeh - bdfg)}{2h^2} + \frac{x(acf h^2 + adeh^2 - adfgh + bceh^2 - bcfgh - bdegh + bdfg^2)}{h^3} + \frac{(ah - bg)}{h^4}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b*x+a)*(d*x+c)*(f*x+e)/(h*x+g),x)

[Out] b*d*f*x**3/(3*h) + x**2*(a*d*f*h + b*c*f*h + b*d*e*h - b*d*f*g)/(2*h**2) + x*(a*c*f*h**2 + a*d*e*h**2 - a*d*f*g*h + b*c*e*h**2 - b*c*f*g*h - b*d*e*g*h + b*d*f*g**2)/h**3 + (a*h - b*g)*(c*h - d*g)*(e*h - f*g)*log(g + h*x)/h**4

Giac [A] time = 1.30425, size = 281, normalized size = 2.23

$$\frac{2bdfh^2x^3 - 3bdfghx^2 + 3bcfh^2x^2 + 3adf h^2x^2 + 3bdh^2x^2e + 6bdfg^2x - 6bcfghx - 6adfghx + 6acf h^2x - 6bdghxe}{6h^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)*(d*x+c)*(f*x+e)/(h*x+g),x, algorithm="giac")
```

```
[Out] 1/6*(2*b*d*f*h^2*x^3 - 3*b*d*f*g*h*x^2 + 3*b*c*f*h^2*x^2 + 3*a*d*f*h^2*x^2 + 3*b*d*h^2*x^2*e + 6*b*d*f*g^2*x - 6*b*c*f*g*h*x - 6*a*d*f*g*h*x + 6*a*c*f*h^2*x - 6*b*d*g*h*x*e + 6*b*c*h^2*x*e + 6*a*d*h^2*x*e)/h^3 - (b*d*f*g^3 - b*c*f*g^2*h - a*d*f*g^2*h + a*c*f*g*h^2 - b*d*g^2*h*e + b*c*g*h^2*e + a*d*g*h^2*e - a*c*h^3*e)*log(abs(h*x + g))/h^4
```

$$3.3 \quad \int \frac{(a+bx)(c+dx)}{(e+fx)(g+hx)} dx$$

Optimal. Leaf size=84

$$\frac{(be - af)(de - cf) \log(e + fx)}{f^2(fg - eh)} - \frac{(bg - ah)(dg - ch) \log(g + hx)}{h^2(fg - eh)} + \frac{bdx}{fh}$$

[Out] (b*d*x)/(f*h) + ((b*e - a*f)*(d*e - c*f)*Log[e + f*x])/(f^2*(f*g - e*h)) - ((b*g - a*h)*(d*g - c*h)*Log[g + h*x])/(h^2*(f*g - e*h))

Rubi [A] time = 0.0860184, antiderivative size = 84, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.04$, Rules used = {142}

$$\frac{(be - af)(de - cf) \log(e + fx)}{f^2(fg - eh)} - \frac{(bg - ah)(dg - ch) \log(g + hx)}{h^2(fg - eh)} + \frac{bdx}{fh}$$

Antiderivative was successfully verified.

[In] Int[((a + b*x)*(c + d*x))/((e + f*x)*(g + h*x)), x]

[Out] (b*d*x)/(f*h) + ((b*e - a*f)*(d*e - c*f)*Log[e + f*x])/(f^2*(f*g - e*h)) - ((b*g - a*h)*(d*g - c*h)*Log[g + h*x])/(h^2*(f*g - e*h))

Rule 142

Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))*((g_.) + (h_.)*(x_)), x_Symbol] := Int[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n*(e + f*x)*(g + h*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x] && (IGtQ[m, 0] || IntegersQ[m, n])

Rubi steps

$$\begin{aligned} \int \frac{(a + bx)(c + dx)}{(e + fx)(g + hx)} dx &= \int \left(\frac{bd}{fh} + \frac{(-be + af)(-de + cf)}{f(fg - eh)(e + fx)} + \frac{(-bg + ah)(-dg + ch)}{h(-fg + eh)(g + hx)} \right) dx \\ &= \frac{bdx}{fh} + \frac{(be - af)(de - cf) \log(e + fx)}{f^2(fg - eh)} - \frac{(bg - ah)(dg - ch) \log(g + hx)}{h^2(fg - eh)} \end{aligned}$$

Mathematica [A] time = 0.0706683, size = 85, normalized size = 1.01

$$\frac{f(bdx(fg - eh) - f(bg - ah)(dg - ch)\log(g + hx)) + h^2(be - af)(de - cf)\log(e + fx)}{f^2h^2(fg - eh)}$$

Antiderivative was successfully verified.

[In] Integrate[((a + b*x)*(c + d*x))/((e + f*x)*(g + h*x)),x]

[Out] ((b*e - a*f)*(d*e - c*f)*h^2*Log[e + f*x] + f*(b*d*h*(f*g - e*h)*x - f*(b*g - a*h)*(d*g - c*h)*Log[g + h*x]))/(f^2*h^2*(f*g - e*h))

Maple [B] time = 0.008, size = 196, normalized size = 2.3

$$\frac{bdx}{fh} - \frac{\ln(fx + e)ac}{eh - fg} + \frac{\ln(fx + e)ade}{f(eh - fg)} + \frac{\ln(fx + e)bce}{f(eh - fg)} - \frac{\ln(fx + e)bde^2}{f^2(eh - fg)} + \frac{\ln(hx + g)ac}{eh - fg} - \frac{\ln(hx + g)adg}{h(eh - fg)} - \frac{\ln(hx + g)adg}{h(eh - fg)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b*x+a)*(d*x+c)/(f*x+e)/(h*x+g),x)

[Out] b*d*x/f/h-1/(e*h-f*g)*ln(f*x+e)*a*c+1/f/(e*h-f*g)*ln(f*x+e)*a*d*e+1/f/(e*h-f*g)*ln(f*x+e)*b*c*e-1/f^2/(e*h-f*g)*ln(f*x+e)*b*d*e^2+1/(e*h-f*g)*ln(h*x+g)*a*c-1/h/(e*h-f*g)*ln(h*x+g)*a*d*g-1/h/(e*h-f*g)*ln(h*x+g)*b*c*g+1/h^2/(e*h-f*g)*ln(h*x+g)*b*d*g^2

Maxima [A] time = 1.37506, size = 140, normalized size = 1.67

$$\frac{bdx}{fh} + \frac{(bde^2 + acf^2 - (bc + ad)ef)\log(fx + e)}{f^3g - ef^2h} - \frac{(bdg^2 + ach^2 - (bc + ad)gh)\log(hx + g)}{fgh^2 - eh^3}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b*x+a)*(d*x+c)/(f*x+e)/(h*x+g),x, algorithm="maxima")

[Out] b*d*x/(f*h) + (b*d*e^2 + a*c*f^2 - (b*c + a*d)*e*f)*log(f*x + e)/(f^3*g - e*f^2*h) - (b*d*g^2 + a*c*h^2 - (b*c + a*d)*g*h)*log(h*x + g)/(f*g*h^2 - e*h^3)

Fricas [A] time = 1.48352, size = 242, normalized size = 2.88

$$\frac{(bde^2 + acf^2 - (bc + ad)ef)h^2 \log(fx + e) + (bdf^2gh - bdefh^2)x - (bdf^2g^2 + acf^2h^2 - (bc + ad)f^2gh) \log(hx + g)}{f^3gh^2 - ef^2h^3}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b*x+a)*(d*x+c)/(f*x+e)/(h*x+g),x, algorithm="fricas")

[Out] $((b*d*e^2 + a*c*f^2 - (b*c + a*d)*e*f)*h^2*\log(f*x + e) + (b*d*f^2*g*h - b*d*e*f*h^2)*x - (b*d*f^2*g^2 + a*c*f^2*h^2 - (b*c + a*d)*f^2*g*h)*\log(h*x + g))/(f^3*g*h^2 - e*f^2*h^3)$

Sympy [B] time = 10.4987, size = 507, normalized size = 6.04

$$\frac{bdx}{fh} + \frac{(ah - bg)(ch - dg) \log\left(x + \frac{acefh^2 + acf^2gh - 2adefgh - 2bcefgh + bde^2gh + bdefg^2 - \frac{e^2fh(ah-bg)(ch-dg)}{eh-fg} + \frac{2ef^2g(ah-bg)(ch-dg)}{eh-fg} - \frac{f^3g^2(ah-bg)(ch-dg)}{h(eh-fg)}}{2acf^2h^2 - adf^2gh - bcef^2h^2 - bcf^2gh + bde^2h^2 + bdf^2g^2}\right)}{h^2(eh - fg)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b*x+a)*(d*x+c)/(f*x+e)/(h*x+g),x)

[Out] $b*d*x/(f*h) + (a*h - b*g)*(c*h - d*g)*\log(x + (a*c*e*f*h**2 + a*c*f**2*g*h - 2*a*d*e*f*g*h - 2*b*c*e*f*g*h + b*d*e**2*g*h + b*d*e*f*g**2 - e**2*f*h*(a*h - b*g)*(c*h - d*g)/(e*h - f*g) + 2*e*f**2*g*(a*h - b*g)*(c*h - d*g)/(e*h - f*g) - f**3*g**2*(a*h - b*g)*(c*h - d*g)/(h*(e*h - f*g)))/(2*a*c*f**2*h**2 - a*d*e*f*h**2 - a*d*f**2*g*h - b*c*e*f*h**2 - b*c*f**2*g*h + b*d*e**2*h**2 + b*d*f**2*g**2))/(h**2*(e*h - f*g)) - (a*f - b*e)*(c*f - d*e)*\log(x + (a*c*e*f*h**2 + a*c*f**2*g*h - 2*a*d*e*f*g*h - 2*b*c*e*f*g*h + b*d*e**2*g*h + b*d*e*f*g**2 + e**2*h**3*(a*f - b*e)*(c*f - d*e)/(f*(e*h - f*g)) - 2*e*g*h**2*(a*f - b*e)*(c*f - d*e)/(e*h - f*g) + f*g**2*h*(a*f - b*e)*(c*f - d*e)/(e*h - f*g))/(2*a*c*f**2*h**2 - a*d*e*f*h**2 - a*d*f**2*g*h - b*c*e*f*h**2 - b*c*f**2*g*h + b*d*e**2*h**2 + b*d*f**2*g**2))/(f**2*(e*h - f*g))$

Giac [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: NotImplementedError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)*(d*x+c)/(f*x+e)/(h*x+g),x, algorithm="giac")
```

```
[Out] Exception raised: NotImplementedError
```


$$3.4 \quad \int \frac{a+bx}{(c+dx)(e+fx)(g+hx)} dx$$

Optimal. Leaf size=108

$$-\frac{(bc-ad)\log(c+dx)}{(de-cf)(dg-ch)} + \frac{(be-af)\log(e+fx)}{(de-cf)(fg-eh)} - \frac{(bg-ah)\log(g+hx)}{(dg-ch)(fg-eh)}$$

[Out] -(((b*c - a*d)*Log[c + d*x])/((d*e - c*f)*(d*g - c*h))) + ((b*e - a*f)*Log[e + f*x])/((d*e - c*f)*(f*g - e*h)) - ((b*g - a*h)*Log[g + h*x])/((d*g - c*h)*(f*g - e*h))

Rubi [A] time = 0.110342, antiderivative size = 108, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.037$, Rules used = {148}

$$-\frac{(bc-ad)\log(c+dx)}{(de-cf)(dg-ch)} + \frac{(be-af)\log(e+fx)}{(de-cf)(fg-eh)} - \frac{(bg-ah)\log(g+hx)}{(dg-ch)(fg-eh)}$$

Antiderivative was successfully verified.

[In] Int[(a + b*x)/((c + d*x)*(e + f*x)*(g + h*x)), x]

[Out] -(((b*c - a*d)*Log[c + d*x])/((d*e - c*f)*(d*g - c*h))) + ((b*e - a*f)*Log[e + f*x])/((d*e - c*f)*(f*g - e*h)) - ((b*g - a*h)*Log[g + h*x])/((d*g - c*h)*(f*g - e*h))

Rule 148

Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_)*((e_.) + (f_.)*(x_))^(p_)*((g_.) + (h_.)*(x_)), x_Symbol] :> Int[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n*(e + f*x)^p*(g + h*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m}, x] && (IntegersQ[m, n, p] || (IGtQ[n, 0] && IGtQ[p, 0]))

Rubi steps

$$\begin{aligned} \int \frac{a+bx}{(c+dx)(e+fx)(g+hx)} dx &= \int \left(\frac{d(-bc+ad)}{(de-cf)(dg-ch)(c+dx)} + \frac{f(-be+af)}{(de-cf)(-fg+eh)(e+fx)} + \frac{h(-bg+ah)}{(dg-ch)(fg-eh)(g+hx)} \right) dx \\ &= -\frac{(bc-ad)\log(c+dx)}{(de-cf)(dg-ch)} + \frac{(be-af)\log(e+fx)}{(de-cf)(fg-eh)} - \frac{(bg-ah)\log(g+hx)}{(dg-ch)(fg-eh)} \end{aligned}$$

Mathematica [A] time = 0.0862102, size = 102, normalized size = 0.94

$$\frac{(bc - ad) \log(c + dx)(fg - eh) - (be - af)(dg - ch) \log(e + fx) + (bg - ah)(de - cf) \log(g + hx)}{(de - cf)(dg - ch)(eh - fg)}$$

Antiderivative was successfully verified.

[In] Integrate[(a + b*x)/((c + d*x)*(e + f*x)*(g + h*x)), x]

[Out] ((b*c - a*d)*(f*g - e*h)*Log[c + d*x] - (b*e - a*f)*(d*g - c*h)*Log[e + f*x] + (d*e - c*f)*(b*g - a*h)*Log[g + h*x])/((d*e - c*f)*(d*g - c*h)*(-(f*g + e*h))

Maple [A] time = 0.007, size = 179, normalized size = 1.7

$$\frac{\ln(dx + c)ad}{(cf - de)(ch - dg)} - \frac{\ln(dx + c)bc}{(cf - de)(ch - dg)} - \frac{\ln(fx + e)af}{(cf - de)(eh - fg)} + \frac{\ln(fx + e)be}{(cf - de)(eh - fg)} + \frac{\ln(hx + g)ah}{(ch - dg)(eh - fg)} - \frac{\ln(hx + g)gh}{(ch - dg)(eh - fg)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b*x+a)/(d*x+c)/(f*x+e)/(h*x+g), x)

[Out] 1/(c*f-d*e)/(c*h-d*g)*ln(d*x+c)*a*d-1/(c*f-d*e)/(c*h-d*g)*ln(d*x+c)*b*c-1/(c*f-d*e)/(e*h-f*g)*ln(f*x+e)*a*f+1/(c*f-d*e)/(e*h-f*g)*ln(f*x+e)*b*e+1/(c*h-d*g)/(e*h-f*g)*ln(h*x+g)*a*h-1/(c*h-d*g)/(e*h-f*g)*ln(h*x+g)*b*g

Maxima [A] time = 1.64723, size = 181, normalized size = 1.68

$$-\frac{(bc - ad) \log(dx + c)}{(d^2e - cdf)g - (cde - c^2f)h} + \frac{(be - af) \log(fx + e)}{(def - cf^2)g - (de^2 - cef)h} - \frac{(bg - ah) \log(hx + g)}{dfg^2 + ceh^2 - (de + cf)gh}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b*x+a)/(d*x+c)/(f*x+e)/(h*x+g), x, algorithm="maxima")

[Out] -(b*c - a*d)*log(d*x + c)/((d^2*e - c*d*f)*g - (c*d*e - c^2*f)*h) + (b*e - a*f)*log(f*x + e)/((d*e*f - c*f^2)*g - (d*e^2 - c*e*f)*h) - (b*g - a*h)*log(h*x + g)/(d*f*g^2 + c*e*h^2 - (d*e + c*f)*g*h)

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)/(d*x+c)/(f*x+e)/(h*x+g),x, algorithm="fricas")
```

```
[Out] Timed out
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)/(d*x+c)/(f*x+e)/(h*x+g),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{bx + a}{(dx + c)(fx + e)(hx + g)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)/(d*x+c)/(f*x+e)/(h*x+g),x, algorithm="giac")
```

```
[Out] integrate((b*x + a)/((d*x + c)*(f*x + e)*(h*x + g)), x)
```

$$3.5 \quad \int \frac{1}{(a+bx)(c+dx)(e+fx)(g+hx)} dx$$

Optimal. Leaf size=163

$$\frac{b^2 \log(a+bx)}{(bc-ad)(be-af)(bg-ah)} - \frac{d^2 \log(c+dx)}{(bc-ad)(de-cf)(dg-ch)} + \frac{f^2 \log(e+fx)}{(be-af)(de-cf)(fg-eh)} - \frac{h^2 \log(g+hx)}{(bg-ah)(dg-ch)(fg-eh)}$$

[Out] (b^2*Log[a + b*x])/((b*c - a*d)*(b*e - a*f)*(b*g - a*h)) - (d^2*Log[c + d*x])/((b*c - a*d)*(d*e - c*f)*(d*g - c*h)) + (f^2*Log[e + f*x])/((b*e - a*f)*(d*e - c*f)*(f*g - e*h)) - (h^2*Log[g + h*x])/((b*g - a*h)*(d*g - c*h)*(f*g - e*h))

Rubi [A] time = 0.211911, antiderivative size = 163, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.034$, Rules used = {180}

$$\frac{b^2 \log(a+bx)}{(bc-ad)(be-af)(bg-ah)} - \frac{d^2 \log(c+dx)}{(bc-ad)(de-cf)(dg-ch)} + \frac{f^2 \log(e+fx)}{(be-af)(de-cf)(fg-eh)} - \frac{h^2 \log(g+hx)}{(bg-ah)(dg-ch)(fg-eh)}$$

Antiderivative was successfully verified.

[In] Int[1/((a + b*x)*(c + d*x)*(e + f*x)*(g + h*x)),x]

[Out] (b^2*Log[a + b*x])/((b*c - a*d)*(b*e - a*f)*(b*g - a*h)) - (d^2*Log[c + d*x])/((b*c - a*d)*(d*e - c*f)*(d*g - c*h)) + (f^2*Log[e + f*x])/((b*e - a*f)*(d*e - c*f)*(f*g - e*h)) - (h^2*Log[g + h*x])/((b*g - a*h)*(d*g - c*h)*(f*g - e*h))

Rule 180

Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_)*((e_.) + (f_.)*(x_))^(p_)*((g_.) + (h_.)*(x_))^(q_), x_Symbol] := Int[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n*(e + f*x)^p*(g + h*x)^q, x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n}, x] && IntegersQ[p, q]

Rubi steps

$$\int \frac{1}{(a+bx)(c+dx)(e+fx)(g+hx)} dx = \int \left(\frac{b^3}{(bc-ad)(be-af)(bg-ah)(a+bx)} - \frac{d^3}{(bc-ad)(-de+cf)(-dg+ch)(c+dx)} \right. \\ \left. = \frac{b^2 \log(a+bx)}{(bc-ad)(be-af)(bg-ah)} - \frac{d^2 \log(c+dx)}{(bc-ad)(de-cf)(dg-ch)} + \frac{f^2 \log(e+fx)}{(be-af)(de-cf)(fg-eh)} - \frac{h^2 \log(g+hx)}{(bg-ah)(dg-ch)(fg-eh)} \right)$$

Mathematica [A] time = 0.246551, size = 164, normalized size = 1.01

$$\frac{b^2 \log(a+bx)}{(bc-ad)(be-af)(bg-ah)} - \frac{d^2 \log(c+dx)}{(bc-ad)(cf-de)(ch-dg)} - \frac{f^2 \log(e+fx)}{(be-af)(de-cf)(eh-fg)} - \frac{h^2 \log(g+hx)}{(bg-ah)(dg-ch)(fg-eh)}$$

Antiderivative was successfully verified.

[In] Integrate[1/((a + b*x)*(c + d*x)*(e + f*x)*(g + h*x)),x]

[Out] (b^2*Log[a + b*x])/((b*c - a*d)*(b*e - a*f)*(b*g - a*h)) - (d^2*Log[c + d*x])/((b*c - a*d)*(-(d*e) + c*f)*(-(d*g) + c*h)) - (f^2*Log[e + f*x])/((b*e - a*f)*(d*e - c*f)*(-(f*g) + e*h)) - (h^2*Log[g + h*x])/((b*g - a*h)*(d*g - c*h)*(f*g - e*h))

Maple [A] time = 0.007, size = 164, normalized size = 1.

$$\frac{d^2 \ln(dx+c)}{(ad-bc)(cf-de)(ch-dg)} - \frac{f^2 \ln(fx+e)}{(af-be)(cf-de)(eh-fg)} + \frac{h^2 \ln(hx+g)}{(ch-dg)(ah-bg)(eh-fg)} - \frac{b^2 \ln(bx+a)}{(ad-bc)(af-be)(ah-bg)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(1/(b*x+a)/(d*x+c)/(f*x+e)/(h*x+g),x)

[Out] d^2/(a*d-b*c)/(c*f-d*e)/(c*h-d*g)*ln(d*x+c)-f^2/(a*f-b*e)/(c*f-d*e)/(e*h-f*g)*ln(f*x+e)+h^2/(c*h-d*g)/(a*h-b*g)/(e*h-f*g)*ln(h*x+g)-b^2/(a*d-b*c)/(a*f-b*e)/(a*h-b*g)*ln(b*x+a)

Maxima [A] time = 1.28156, size = 419, normalized size = 2.57

$$\frac{b^2 \log(bx+a)}{((b^3c-ab^2d)e-(ab^2c-a^2bd)f)g - ((ab^2c-a^2bd)e-(a^2bc-a^3d)f)h} - \frac{d^2 \log(dx+c)}{((bcd^2-ad^3)e-(bc^2d-acd^2)f)g - ((bc^2d-acd^2)f)g - ((bc^2d-acd^2)f)g}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*x+a)/(d*x+c)/(f*x+e)/(h*x+g),x, algorithm="maxima")
```

```
[Out] b^2*log(b*x + a)/(((b^3*c - a*b^2*d)*e - (a*b^2*c - a^2*b*d)*f)*g - ((a*b^2
*c - a^2*b*d)*e - (a^2*b*c - a^3*d)*f)*h) - d^2*log(d*x + c)/(((b*c*d^2 - a
*d^3)*e - (b*c^2*d - a*c*d^2)*f)*g - ((b*c^2*d - a*c*d^2)*e - (b*c^3 - a*c^
2*d)*f)*h) + f^2*log(f*x + e)/((b*d*e^2*f + a*c*f^3 - (b*c + a*d)*e*f^2)*g
- (b*d*e^3 + a*c*e*f^2 - (b*c + a*d)*e^2*f)*h) - h^2*log(h*x + g)/(b*d*f*g^
3 - a*c*e*h^3 - (b*d*e + (b*c + a*d)*f)*g^2*h + (a*c*f + (b*c + a*d)*e)*g*h
^2)
```

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*x+a)/(d*x+c)/(f*x+e)/(h*x+g),x, algorithm="fricas")
```

```
[Out] Timed out
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*x+a)/(d*x+c)/(f*x+e)/(h*x+g),x)
```

```
[Out] Timed out
```

Giac [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*x+a)/(d*x+c)/(f*x+e)/(h*x+g),x, algorithm="giac")
```

```
[Out] Timed out
```

3.6

$$\int \frac{x}{(1+x)(2+x)(3+x)} dx$$

Optimal. Leaf size=23

$$-\frac{1}{2} \log(x+1) + 2 \log(x+2) - \frac{3}{2} \log(x+3)$$

[Out] -Log[1 + x]/2 + 2*Log[2 + x] - (3*Log[3 + x])/2

Rubi [A] time = 0.0107876, antiderivative size = 23, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.059$, Rules used = {148}

$$-\frac{1}{2} \log(x+1) + 2 \log(x+2) - \frac{3}{2} \log(x+3)$$

Antiderivative was successfully verified.

[In] Int[x/((1 + x)*(2 + x)*(3 + x)), x]

[Out] -Log[1 + x]/2 + 2*Log[2 + x] - (3*Log[3 + x])/2

Rule 148

Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_)*((e_.) + (f_.)*(x_))^(p_)*((g_.) + (h_.)*(x_)), x_Symbol] :> Int[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n*(e + f*x)^p*(g + h*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m}, x] && (IntegersQ[m, n, p] || (IGtQ[n, 0] && IGtQ[p, 0]))

Rubi steps

$$\begin{aligned} \int \frac{x}{(1+x)(2+x)(3+x)} dx &= \int \left(-\frac{1}{2(1+x)} + \frac{2}{2+x} - \frac{3}{2(3+x)} \right) dx \\ &= -\frac{1}{2} \log(1+x) + 2 \log(2+x) - \frac{3}{2} \log(3+x) \end{aligned}$$

Mathematica [A] time = 0.0062417, size = 23, normalized size = 1.

$$-\frac{1}{2} \log(x+1) + 2 \log(x+2) - \frac{3}{2} \log(x+3)$$

Antiderivative was successfully verified.

[In] Integrate[x/((1 + x)*(2 + x)*(3 + x)),x]

[Out] -Log[1 + x]/2 + 2*Log[2 + x] - (3*Log[3 + x])/2

Maple [A] time = 0.006, size = 20, normalized size = 0.9

$$-\frac{\ln(1+x)}{2} + 2 \ln(2+x) - \frac{3 \ln(3+x)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(x/(1+x)/(2+x)/(3+x),x)

[Out] -1/2*ln(1+x)+2*ln(2+x)-3/2*ln(3+x)

Maxima [A] time = 2.15871, size = 26, normalized size = 1.13

$$-\frac{3}{2} \log(x+3) + 2 \log(x+2) - \frac{1}{2} \log(x+1)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x/(1+x)/(2+x)/(3+x),x, algorithm="maxima")

[Out] -3/2*log(x + 3) + 2*log(x + 2) - 1/2*log(x + 1)

Fricas [A] time = 1.68537, size = 66, normalized size = 2.87

$$-\frac{3}{2} \log(x+3) + 2 \log(x+2) - \frac{1}{2} \log(x+1)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x/(1+x)/(2+x)/(3+x),x, algorithm="fricas")

[Out] $-3/2*\log(x + 3) + 2*\log(x + 2) - 1/2*\log(x + 1)$

Sympy [A] time = 0.115222, size = 20, normalized size = 0.87

$$-\frac{\log(x+1)}{2} + 2\log(x+2) - \frac{3\log(x+3)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate(x/(1+x)/(2+x)/(3+x),x)`

[Out] $-\log(x + 1)/2 + 2*\log(x + 2) - 3*\log(x + 3)/2$

Giac [A] time = 2.2248, size = 30, normalized size = 1.3

$$-\frac{3}{2} \log(|x+3|) + 2 \log(|x+2|) - \frac{1}{2} \log(|x+1|)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate(x/(1+x)/(2+x)/(3+x),x, algorithm="giac")`

[Out] $-3/2*\log(\text{abs}(x + 3)) + 2*\log(\text{abs}(x + 2)) - 1/2*\log(\text{abs}(x + 1))$

$$3.7 \quad \int \frac{-x^2+x^3}{(-6+x)(3+5x)^3} dx$$

Optimal. Leaf size=43

$$\frac{201}{15125(5x+3)} - \frac{12}{1375(5x+3)^2} + \frac{20 \log(6-x)}{3993} + \frac{1493 \log(5x+3)}{499125}$$

[Out] $-12/(1375*(3 + 5*x)^2) + 201/(15125*(3 + 5*x)) + (20*\text{Log}[6 - x])/3993 + (1493*\text{Log}[3 + 5*x])/499125$

Rubi [A] time = 0.0366784, antiderivative size = 43, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$, Rules used = {1593, 148}

$$\frac{201}{15125(5x+3)} - \frac{12}{1375(5x+3)^2} + \frac{20 \log(6-x)}{3993} + \frac{1493 \log(5x+3)}{499125}$$

Antiderivative was successfully verified.

[In] $\text{Int}[(-x^2 + x^3)/((-6 + x)*(3 + 5*x)^3), x]$

[Out] $-12/(1375*(3 + 5*x)^2) + 201/(15125*(3 + 5*x)) + (20*\text{Log}[6 - x])/3993 + (1493*\text{Log}[3 + 5*x])/499125$

Rule 1593

$\text{Int}[(u_.)*((a_.)*(x_)^{(p_.)} + (b_.)*(x_)^{(q_.)})^{(n_.)}, x_Symbol] \rightarrow \text{Int}[u*x^{(n*p)}*(a + b*x^{(q-p)})^n, x] /; \text{FreeQ}\{a, b, p, q\}, x] \ \&\& \ \text{IntegerQ}[n] \ \&\& \ \text{PosQ}[q - p]$

Rule 148

$\text{Int}[((a_.) + (b_.)*(x_))^{(m_.)}*((c_.) + (d_.)*(x_))^{(n_.)}*((e_.) + (f_.)*(x_))^{(p_.)}*((g_.) + (h_.)*(x_)), x_Symbol] \rightarrow \text{Int}[\text{ExpandIntegrand}[(a + b*x)^m*(c + d*x)^n*(e + f*x)^p*(g + h*x), x], x] /; \text{FreeQ}\{a, b, c, d, e, f, g, h, m\}, x] \ \&\& \ (\text{IntegersQ}[m, n, p] \ || \ (\text{IGtQ}[n, 0] \ \&\& \ \text{IGtQ}[p, 0]))$

Rubi steps

$$\int \frac{-x^2 + x^3}{(-6 + x)(3 + 5x)^3} dx = \int \frac{(-1 + x)x^2}{(-6 + x)(3 + 5x)^3} dx$$

$$= \int \left(\frac{20}{3993(-6 + x)} + \frac{24}{275(3 + 5x)^3} - \frac{201}{3025(3 + 5x)^2} + \frac{1493}{99825(3 + 5x)} \right) dx$$

$$= -\frac{12}{1375(3 + 5x)^2} + \frac{201}{15125(3 + 5x)} + \frac{20 \log(6 - x)}{3993} + \frac{1493 \log(3 + 5x)}{499125}$$

Mathematica [A] time = 0.020165, size = 33, normalized size = 0.77

$$\frac{\frac{99(335x+157)}{(5x+3)^2} + 2500 \log(x-6) + 1493 \log(5x+3)}{499125}$$

Antiderivative was successfully verified.

[In] Integrate[(-x^2 + x^3)/((-6 + x)*(3 + 5*x)^3), x]

[Out] ((99*(157 + 335*x))/(3 + 5*x)^2 + 2500*Log[-6 + x] + 1493*Log[3 + 5*x])/499125

Maple [A] time = 0.007, size = 34, normalized size = 0.8

$$\frac{20 \ln(x-6)}{3993} - \frac{12}{1375(3+5x)^2} + \frac{201}{45375+75625x} + \frac{1493 \ln(3+5x)}{499125}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((x^3-x^2)/(x-6)/(3+5*x)^3, x)

[Out] 20/3993*ln(x-6)-12/1375/(3+5*x)^2+201/15125/(3+5*x)+1493/499125*ln(3+5*x)

Maxima [A] time = 1.23242, size = 46, normalized size = 1.07

$$\frac{3(335x+157)}{15125(25x^2+30x+9)} + \frac{1493}{499125} \log(5x+3) + \frac{20}{3993} \log(x-6)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((x^3-x^2)/(-6+x)/(3+5*x)^3,x, algorithm="maxima")

[Out] $\frac{3}{15125} \cdot (335x + 157) / (25x^2 + 30x + 9) + \frac{1493}{499125} \cdot \log(5x + 3) + \frac{20}{3} \cdot 993 \cdot \log(x - 6)$

Fricas [A] time = 1.6749, size = 170, normalized size = 3.95

$$\frac{1493(25x^2 + 30x + 9) \log(5x + 3) + 2500(25x^2 + 30x + 9) \log(x - 6) + 33165x + 15543}{499125(25x^2 + 30x + 9)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((x^3-x^2)/(-6+x)/(3+5*x)^3,x, algorithm="fricas")

[Out] $\frac{1}{499125} \cdot (1493 \cdot (25x^2 + 30x + 9) \cdot \log(5x + 3) + 2500 \cdot (25x^2 + 30x + 9) \cdot \log(x - 6) + 33165x + 15543) / (25x^2 + 30x + 9)$

Sympy [A] time = 0.142484, size = 32, normalized size = 0.74

$$\frac{1005x + 471}{378125x^2 + 453750x + 136125} + \frac{20 \log(x - 6)}{3993} + \frac{1493 \log\left(x + \frac{3}{5}\right)}{499125}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((x**3-x**2)/(-6+x)/(3+5*x)**3,x)

[Out] $(1005x + 471) / (378125x^2 + 453750x + 136125) + 20 \cdot \log(x - 6) / 3993 + 1493 \cdot \log(x + 3/5) / 499125$

Giac [A] time = 2.16757, size = 42, normalized size = 0.98

$$\frac{3(335x + 157)}{15125(5x + 3)^2} + \frac{1493}{499125} \log(|5x + 3|) + \frac{20}{3993} \log(|x - 6|)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((x^3-x^2)/(-6+x)/(3+5*x)^3,x, algorithm="giac")
```

```
[Out] 3/15125*(335*x + 157)/(5*x + 3)^2 + 1493/499125*log(abs(5*x + 3)) + 20/3993  
*log(abs(x - 6))
```

$$3.8 \quad \int \frac{(a+bx)^3 \sqrt{c+dx}(e+fx)}{x} dx$$

Optimal. Leaf size=227

$$\frac{2(c+dx)^{3/2} \left(2(3a^2bd^2(45de-16cf) + 20a^3d^3f - 9ab^2cd(7de-4cf) + 4b^3c^2(3de-2cf)) + 3bdx(21abd^2e - 4(bc-ad)) \right)}{315d^4}$$

[Out] $2a^3e\sqrt{c+dx} + (2(3bde - 2bcf + 2adf))(a+bx)^2(c+dx)^{3/2}/(21d^2) + (2f(a+bx)^3(c+dx)^{3/2})/(9d) + (2(c+dx)^{3/2}(2(20a^3d^3f + 3a^2bd^2(45de-16cf) - 9ab^2cd(7de-4cf) + 4b^3c^2(3de-2cf)) + 3bdx(21abd^2e - 4(bc-ad))(3bde - 2bcf + 2adf)))/ (315d^4) - 2a^3\sqrt{c}e\text{ArcTanh}[\sqrt{c+dx}/\sqrt{c}]$

Rubi [A] time = 0.257237, antiderivative size = 227, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.2$, Rules used = {153, 147, 50, 63, 208}

$$\frac{2(c+dx)^{3/2} \left(2(3a^2bd^2(45de-16cf) + 20a^3d^3f - 9ab^2cd(7de-4cf) + 4b^3c^2(3de-2cf)) + 3bdx(21abd^2e - 4(bc-ad)) \right)}{315d^4}$$

Antiderivative was successfully verified.

[In] Int[((a + b*x)^3*sqrt[c + d*x]*(e + f*x))/x,x]

[Out] $2a^3e\sqrt{c+dx} + (2(3bde - 2bcf + 2adf))(a+bx)^2(c+dx)^{3/2}/(21d^2) + (2f(a+bx)^3(c+dx)^{3/2})/(9d) + (2(c+dx)^{3/2}(2(20a^3d^3f + 3a^2bd^2(45de-16cf) - 9ab^2cd(7de-4cf) + 4b^3c^2(3de-2cf)) + 3bdx(21abd^2e - 4(bc-ad))(3bde - 2bcf + 2adf)))/ (315d^4) - 2a^3\sqrt{c}e\text{ArcTanh}[\sqrt{c+dx}/\sqrt{c}]$

Rule 153

Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_)*((e_.) + (f_.)*(x_))^(p_)*((g_.) + (h_.)*(x_)), x_Symbol] :> Simp[(h*(a + b*x)^m*(c + d*x)^(n+1)*(e + f*x)^(p+1))/(d*f*(m+n+p+2)), x] + Dist[1/(d*f*(m+n+p+2)), Int[(a + b*x)^(m-1)*(c + d*x)^n*(e + f*x)^p*Simp[a*d*f*g*(m+n+p+2) - h*(b*c*e*m + a*(d*e*(n+1) + c*f*(p+1))) + (b*d*f*g*(m+n+p+2) + h*(a*d*f*m - b*(d*e*(m+n+1) + c*f*(m+p+1)))]*x, x], x] /

```
; FreeQ[{a, b, c, d, e, f, g, h, n, p}, x] && GtQ[m, 0] && NeQ[m + n + p + 2, 0] && IntegerQ[m]
```

Rule 147

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))*(g_.) + (h_.)*(x_)), x_Symbol] := -Simp[((a*d*f*h*(n + 2) + b*c*f*h*(m + 2) - b*d*(f*g + e*h)*(m + n + 3) - b*d*f*h*(m + n + 2)*x)*(a + b*x)^(m + 1)*(c + d*x)^(n + 1))/(b^2*d^2*(m + n + 2)*(m + n + 3)), x] + Dist[(a^2*d^2*f*h*(n + 1)*(n + 2) + a*b*d*(n + 1)*(2*c*f*h*(m + 1) - d*(f*g + e*h)*(m + n + 3)) + b^2*(c^2*f*h*(m + 1)*(m + 2) - c*d*(f*g + e*h)*(m + 1)*(m + n + 3) + d^2*e*g*(m + n + 2)*(m + n + 3)))/(b^2*d^2*(m + n + 2)*(m + n + 3)), Int[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n}, x] && NeQ[m + n + 2, 0] && NeQ[m + n + 3, 0]
```

Rule 50

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := Simp[(a + b*x)^(m + 1)*(c + d*x)^n/(b*(m + n + 1)), x] + Dist[(n*(b*c - a*d))/(b*(m + n + 1)), Int[(a + b*x)^m*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0] && GtQ[n, 0] && NeQ[m + n + 1, 0] && !(IGtQ[m, 0] && (!IntegerQ[n] || (GtQ[m, 0] && LtQ[m - n, 0]))) && !ILtQ[m + n + 2, 0] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := With[{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b + (d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Denominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] := Simp[(Rt[-(a/b), 2]*ArcTanh[x/Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rubi steps

$$\begin{aligned}
\int \frac{(a+bx)^3 \sqrt{c+dx}(e+fx)}{x} dx &= \frac{2f(a+bx)^3(c+dx)^{3/2}}{9d} + \frac{2 \int \frac{(a+bx)^2 \sqrt{c+dx} \left(\frac{9ade}{2} + \frac{3}{2}(3bde-2bcf+2adf)x \right)}{x} dx}{9d} \\
&= \frac{2(3bde-2bcf+2adf)(a+bx)^2(c+dx)^{3/2}}{21d^2} + \frac{2f(a+bx)^3(c+dx)^{3/2}}{9d} + \frac{4 \int \frac{(a+bx)\sqrt{c+dx}}{x} dx}{9d} \\
&= \frac{2(3bde-2bcf+2adf)(a+bx)^2(c+dx)^{3/2}}{21d^2} + \frac{2f(a+bx)^3(c+dx)^{3/2}}{9d} + \frac{2(c+dx)^{3/2}}{9d} \left(\frac{2(a+bx)^2}{c+dx} + \frac{2(a+bx)}{c+dx} + \frac{2}{c+dx} \right) \\
&= 2a^3 e \sqrt{c+dx} + \frac{2(3bde-2bcf+2adf)(a+bx)^2(c+dx)^{3/2}}{21d^2} + \frac{2f(a+bx)^3(c+dx)^{3/2}}{9d} \\
&= 2a^3 e \sqrt{c+dx} + \frac{2(3bde-2bcf+2adf)(a+bx)^2(c+dx)^{3/2}}{21d^2} + \frac{2f(a+bx)^3(c+dx)^{3/2}}{9d} \\
&= 2a^3 e \sqrt{c+dx} + \frac{2(3bde-2bcf+2adf)(a+bx)^2(c+dx)^{3/2}}{21d^2} + \frac{2f(a+bx)^3(c+dx)^{3/2}}{9d}
\end{aligned}$$

Mathematica [A] time = 0.263712, size = 205, normalized size = 0.9

$$\frac{2 \left(3de \left(35b(c+dx)^{3/2} (3a^2d^2 - 3abcd + b^2c^2) + 105a^3d^3 \sqrt{c+dx} - 105a^3 \sqrt{cd^3} \tanh^{-1} \left(\frac{\sqrt{c+dx}}{\sqrt{c}} \right) - 21b^2(c+dx)^{5/2} (2bc - 3) \right) \right)}{3}$$

Antiderivative was successfully verified.

[In] Integrate[((a + b*x)^3*Sqrt[c + d*x]*(e + f*x))/x,x]

[Out] (2*(-(f*(c + d*x)^(3/2)*(105*(b*c - a*d)^3 - 189*b*(b*c - a*d)^2*(c + d*x) + 135*b^2*(b*c - a*d)*(c + d*x)^2 - 35*b^3*(c + d*x)^3)) + 3*d*e*(105*a^3*d^3*Sqrt[c + d*x] + 35*b*(b^2*c^2 - 3*a*b*c*d + 3*a^2*d^2)*(c + d*x)^(3/2) - 21*b^2*(2*b*c - 3*a*d)*(c + d*x)^(5/2) + 15*b^3*(c + d*x)^(7/2) - 105*a^3*Sqrt[c]*d^3*ArcTanh[Sqrt[c + d*x]/Sqrt[c]]))/ (315*d^4)

Maple [A] time = 0.008, size = 301, normalized size = 1.3

$$2 \frac{1}{d^4} \left(\frac{1}{9} f b^3 (dx + c)^{9/2} + \frac{3}{7} (dx + c)^{7/2} a b^2 d f - \frac{3}{7} (dx + c)^{7/2} b^3 c f + \frac{1}{7} (dx + c)^{7/2} b^3 d e + \frac{3}{5} (dx + c)^{5/2} a^2 b d^2 f - \dots \right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x+a)^3*(f*x+e)*(d*x+c)^(1/2)/x,x)
```

```
[Out] 2/d^4*(1/9*f*b^3*(d*x+c)^(9/2)+3/7*(d*x+c)^(7/2)*a*b^2*d*f-3/7*(d*x+c)^(7/2)
)*b^3*c*f+1/7*(d*x+c)^(7/2)*b^3*d*e+3/5*(d*x+c)^(5/2)*a^2*b*d^2*f-6/5*(d*x+
c)^(5/2)*a*b^2*c*d*f+3/5*(d*x+c)^(5/2)*a*b^2*d^2*e+3/5*(d*x+c)^(5/2)*b^3*c^
2*f-2/5*(d*x+c)^(5/2)*b^3*c*d*e+1/3*(d*x+c)^(3/2)*a^3*d^3*f-(d*x+c)^(3/2)*a
^2*b*c*d^2*f+(d*x+c)^(3/2)*a^2*b*d^3*e+(d*x+c)^(3/2)*a*b^2*c^2*d*f-(d*x+c)^(
3/2)*a*b^2*c*d^2*e-1/3*(d*x+c)^(3/2)*b^3*c^3*f+1/3*(d*x+c)^(3/2)*b^3*c^2*d
*e+a^3*d^4*e*(d*x+c)^(1/2)-a^3*c^(1/2)*d^4*e*arctanh((d*x+c)^(1/2)/c^(1/2))
)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^3*(f*x+e)*(d*x+c)^(1/2)/x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 1.82981, size = 1419, normalized size = 6.25

$$\left[\frac{315 a^3 \sqrt{cd^4} e \log\left(\frac{dx - 2\sqrt{dx+c}\sqrt{c+2c}}{x}\right) + 2(35 b^3 d^4 f x^4 + 5(9 b^3 d^4 e + (b^3 c d^3 + 27 a b^2 d^4) f) x^3 + 3(3(b^3 c d^3 + 21 a b^2 d^4) e - (2 b^3 c^2 d^2 - 9 a b^2 c d^3 - 63 a^2 b d^4) f) x^2 + 3(8 b^3 c^3 d - 42 a b^2 c^2 d^2 + 105 a^2 b c d^3 + 105 a^3 d^4) e - (16 b^3 c^4 - 72 a b^2 c^3 d + 126 a^2 b c^2 d^2 - 105 a^3 c d^3) f - (3(4 b^3 c^2 d^2 - 21 a b^2 c d^3 - 105 a^2 b d^4) e - (8 b^3 c^3 d - 36 a b^2 c^2 d^2 + 63 a^2 b c d^3 + 105 a^3 d^4) f) x) \sqrt{d x + c}}{d^4}, \frac{2}{315} (315 a^3 \sqrt{-c} d^4 e \arctan(\sqrt{d x + c} \sqrt{-c} / c) + (35 a^3 d^4 e \arctan(\sqrt{d x + c} \sqrt{-c} / c) + (35 b^3 d^4 f x^4 + 5(9 b^3 d^4 e + (b^3 c d^3 + 27 a b^2 d^4) f) x^3 + 3(3(b^3 c d^3 + 21 a b^2 d^4) e - (2 b^3 c^2 d^2 - 9 a b^2 c d^3 - 63 a^2 b d^4) f) x^2 + 3(8 b^3 c^3 d - 42 a b^2 c^2 d^2 + 105 a^2 b c d^3 + 105 a^3 d^4) e - (16 b^3 c^4 - 72 a b^2 c^3 d + 126 a^2 b c^2 d^2 - 105 a^3 c d^3) f - (3(4 b^3 c^2 d^2 - 21 a b^2 c d^3 - 105 a^2 b d^4) e - (8 b^3 c^3 d - 36 a b^2 c^2 d^2 + 63 a^2 b c d^3 + 105 a^3 d^4) f) x) \sqrt{d x + c}) \sqrt{-c}}{d^4} \right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^3*(f*x+e)*(d*x+c)^(1/2)/x,x, algorithm="fricas")
```

```
[Out] [1/315*(315*a^3*sqrt(c)*d^4*e*log((d*x - 2*sqrt(d*x + c)*sqrt(c) + 2*c)/x)
+ 2*(35*b^3*d^4*f*x^4 + 5*(9*b^3*d^4*e + (b^3*c*d^3 + 27*a*b^2*d^4)*f)*x^3
+ 3*(3*(b^3*c*d^3 + 21*a*b^2*d^4)*e - (2*b^3*c^2*d^2 - 9*a*b^2*c*d^3 - 63*a
^2*b*d^4)*f)*x^2 + 3*(8*b^3*c^3*d - 42*a*b^2*c^2*d^2 + 105*a^2*b*c*d^3 + 10
5*a^3*d^4)*e - (16*b^3*c^4 - 72*a*b^2*c^3*d + 126*a^2*b*c^2*d^2 - 105*a^3*c
*d^3)*f - (3*(4*b^3*c^2*d^2 - 21*a*b^2*c*d^3 - 105*a^2*b*d^4)*e - (8*b^3*c^
3*d - 36*a*b^2*c^2*d^2 + 63*a^2*b*c*d^3 + 105*a^3*d^4)*f)*x)*sqrt(d*x + c)
/d^4, 2/315*(315*a^3*sqrt(-c)*d^4*e*arctan(sqrt(d*x + c)*sqrt(-c)/c) + (35*
```

$$b^3 d^4 f x^4 + 5(9 b^3 d^4 e + (b^3 c d^3 + 27 a b^2 d^4) f) x^3 + 3(3(b^3 c d^3 + 21 a b^2 d^4) e - (2 b^3 c^2 d^2 - 9 a b^2 c d^3 - 63 a^2 b d^4) f) x^2 + 3(8 b^3 c^3 d - 42 a b^2 c^2 d^2 + 105 a^2 b c d^3 + 105 a^3 d^4) e - (16 b^3 c^4 - 72 a b^2 c^3 d + 126 a^2 b c^2 d^2 - 105 a^3 c d^3) f - (3(4 b^3 c^2 d^2 - 21 a b^2 c d^3 - 105 a^2 b d^4) e - (8 b^3 c^3 d - 36 a b^2 c^2 d^2 + 63 a^2 b c d^3 + 105 a^3 d^4) f) x) \sqrt{d x + c} / d^4]$$

Sympy [A] time = 26.773, size = 274, normalized size = 1.21

$$\frac{2a^3 c e \operatorname{atan}\left(\frac{\sqrt{c+dx}}{\sqrt{-c}}\right)}{\sqrt{-c}} + 2a^3 e \sqrt{c+dx} + \frac{2b^3 f (c+dx)^{\frac{9}{2}}}{9d^4} + \frac{2(c+dx)^{\frac{7}{2}} (3ab^2 d f - 3b^3 c f + b^3 d e)}{7d^4} + \frac{2(c+dx)^{\frac{5}{2}} (3a^2 b d^2 f - c^2 d^2 e)}{7d^4}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b*x+a)**3*(f*x+e)*(d*x+c)**(1/2)/x,x)

[Out] 2*a**3*c*e*atan(sqrt(c + d*x)/sqrt(-c))/sqrt(-c) + 2*a**3*e*sqrt(c + d*x) + 2*b**3*f*(c + d*x)**(9/2)/(9*d**4) + 2*(c + d*x)**(7/2)*(3*a*b**2*d*f - 3*b**3*c*f + b**3*d*e)/(7*d**4) + 2*(c + d*x)**(5/2)*(3*a**2*b*d**2*f - 6*a*b**2*c*d*f + 3*a*b**2*d**2*e + 3*b**3*c**2*f - 2*b**3*c*d*e)/(5*d**4) + 2*(c + d*x)**(3/2)*(a**3*d**3*f - 3*a**2*b*c*d**2*f + 3*a**2*b*d**3*e + 3*a*b**2*c**2*d*f - 3*a*b**2*c*d**2*e - b**3*c**3*f + b**3*c**2*d*e)/(3*d**4)

Giac [A] time = 2.37989, size = 456, normalized size = 2.01

$$\frac{2a^3 c \arctan\left(\frac{\sqrt{dx+c}}{\sqrt{-c}}\right) e}{\sqrt{-c}} + \frac{2\left(35(dx+c)^{\frac{9}{2}} b^3 d^{32} f - 135(dx+c)^{\frac{7}{2}} b^3 c d^{32} f + 189(dx+c)^{\frac{5}{2}} b^3 c^2 d^{32} f - 105(dx+c)^{\frac{3}{2}} b^3 c^3 d^{32} f\right)}{7d^4}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b*x+a)^3*(f*x+e)*(d*x+c)^(1/2)/x,x, algorithm="giac")

[Out] 2*a^3*c*arctan(sqrt(d*x + c)/sqrt(-c))*e/sqrt(-c) + 2/315*(35*(d*x + c)^(9/2)*b^3*d^32*f - 135*(d*x + c)^(7/2)*b^3*c*d^32*f + 189*(d*x + c)^(5/2)*b^3*c^2*d^32*f - 105*(d*x + c)^(3/2)*b^3*c^3*d^32*f + 135*(d*x + c)^(7/2)*a*b^2*d^33*f - 378*(d*x + c)^(5/2)*a*b^2*c*d^33*f + 315*(d*x + c)^(3/2)*a*b^2*c^2*d^33*f + 189*(d*x + c)^(5/2)*a^2*b*d^34*f - 315*(d*x + c)^(3/2)*a^2*b*c*d^34*f + 105*(d*x + c)^(3/2)*a^3*d^35*f + 45*(d*x + c)^(7/2)*b^3*d^33*e - 12

$$\frac{6*(d*x + c)^{(5/2)}*b^3*c*d^{33}*e + 105*(d*x + c)^{(3/2)}*b^3*c^2*d^{33}*e + 189*(d*x + c)^{(5/2)}*a*b^2*d^{34}*e - 315*(d*x + c)^{(3/2)}*a*b^2*c*d^{34}*e + 315*(d*x + c)^{(3/2)}*a^2*b*d^{35}*e + 315*\text{sqrt}(d*x + c)*a^3*d^{36}*e}{d^{36}}$$

$$3.9 \quad \int \frac{(a+bx)^2 \sqrt{c+dx}(e+fx)}{x} dx$$

Optimal. Leaf size=146

$$\frac{2(c+dx)^{3/2} \left(2(10a^2d^2f + 7abd(5de - 2cf) + b^2(-c)(7de - 4cf)) + 3bdx(4adf - 4bcf + 7bde) \right)}{105d^3} + 2a^2e\sqrt{c+dx} - 2a^2\sqrt{c}$$

[Out] 2*a^2*e*Sqrt[c + d*x] + (2*f*(a + b*x)^2*(c + d*x)^(3/2))/(7*d) + (2*(c + d*x)^(3/2)*(2*(10*a^2*d^2*f - b^2*c*(7*d*e - 4*c*f) + 7*a*b*d*(5*d*e - 2*c*f)) + 3*b*d*(7*b*d*e - 4*b*c*f + 4*a*d*f)*x))/(105*d^3) - 2*a^2*Sqrt[c]*e*ArcTanh[Sqrt[c + d*x]/Sqrt[c]]

Rubi [A] time = 0.0981034, antiderivative size = 146, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.2$, Rules used = {153, 147, 50, 63, 208}

$$\frac{2(c+dx)^{3/2} \left(2(10a^2d^2f + 7abd(5de - 2cf) + b^2(-c)(7de - 4cf)) + 3bdx(4adf - 4bcf + 7bde) \right)}{105d^3} + 2a^2e\sqrt{c+dx} - 2a^2\sqrt{c}$$

Antiderivative was successfully verified.

[In] Int[((a + b*x)^2*Sqrt[c + d*x]*(e + f*x))/x,x]

[Out] 2*a^2*e*Sqrt[c + d*x] + (2*f*(a + b*x)^2*(c + d*x)^(3/2))/(7*d) + (2*(c + d*x)^(3/2)*(2*(10*a^2*d^2*f - b^2*c*(7*d*e - 4*c*f) + 7*a*b*d*(5*d*e - 2*c*f)) + 3*b*d*(7*b*d*e - 4*b*c*f + 4*a*d*f)*x))/(105*d^3) - 2*a^2*Sqrt[c]*e*ArcTanh[Sqrt[c + d*x]/Sqrt[c]]

Rule 153

Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_)*((e_.) + (f_.)*(x_))^(p_)*((g_.) + (h_.)*(x_)), x_Symbol] :> Simp[(h*(a + b*x)^(m*(c + d*x)^(n + 1)*(e + f*x)^(p + 1))/(d*f*(m + n + p + 2)), x] + Dist[1/(d*f*(m + n + p + 2)), Int[(a + b*x)^(m - 1)*(c + d*x)^(n*(e + f*x)^p*Simp[a*d*f*g*(m + n + p + 2) - h*(b*c*e*m + a*(d*e*(n + 1) + c*f*(p + 1))] + (b*d*f*g*(m + n + p + 2) + h*(a*d*f*m - b*(d*e*(m + n + 1) + c*f*(m + p + 1))))*x, x], x], x] / ; FreeQ[{a, b, c, d, e, f, g, h, n, p}, x] && GtQ[m, 0] && NeQ[m + n + p + 2, 0] && IntegerQ[m]

Rule 147

```

Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))
*((g_.) + (h_.)*(x_)), x_Symbol] := -Simp[((a*d*f*h*(n + 2) + b*c*f*h*(m
+ 2) - b*d*(f*g + e*h)*(m + n + 3) - b*d*f*h*(m + n + 2)*x)*(a + b*x)^(m +
1)*(c + d*x)^(n + 1))/(b^2*d^2*(m + n + 2)*(m + n + 3)), x] + Dist[(a^2*d^2
*f*h*(n + 1)*(n + 2) + a*b*d*(n + 1)*(2*c*f*h*(m + 1) - d*(f*g + e*h)*(m +
n + 3)) + b^2*(c^2*f*h*(m + 1)*(m + 2) - c*d*(f*g + e*h)*(m + 1)*(m + n + 3
) + d^2*e*g*(m + n + 2)*(m + n + 3)))/(b^2*d^2*(m + n + 2)*(m + n + 3)), In
t[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n},
x] && NeQ[m + n + 2, 0] && NeQ[m + n + 3, 0]

```

Rule 50

```

Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + n + 1)), x] + Dist[(n*(b*c - a*d))/
(b*(m + n + 1)), Int[(a + b*x)^m*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b,
c, d}, x] && NeQ[b*c - a*d, 0] && GtQ[n, 0] && NeQ[m + n + 1, 0] && !(IGtQ
[m, 0] && (!IntegerQ[n] || (GtQ[m, 0] && LtQ[m - n, 0]))) && !ILtQ[m + n
+ 2, 0] && IntLinearQ[a, b, c, d, m, n, x]

```

Rule 63

```

Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]

```

Rule 208

```

Int[((a_.) + (b_.)*(x_)^2)^(-1), x_Symbol] := Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]

```

Rubi steps

$$\begin{aligned}
\int \frac{(a+bx)^2 \sqrt{c+dx}(e+fx)}{x} dx &= \frac{2f(a+bx)^2(c+dx)^{3/2}}{7d} + \frac{2 \int \frac{(a+bx)\sqrt{c+dx} \left(\frac{7ade}{2} + \frac{1}{2}(7bde-4bcf+4adf)x \right)}{x} dx}{7d} \\
&= \frac{2f(a+bx)^2(c+dx)^{3/2}}{7d} + \frac{2(c+dx)^{3/2} \left(2(10a^2d^2f - b^2c(7de-4cf)) + 7abd(5de-2cf) \right)}{105d^3} \\
&= 2a^2e\sqrt{c+dx} + \frac{2f(a+bx)^2(c+dx)^{3/2}}{7d} + \frac{2(c+dx)^{3/2} \left(2(10a^2d^2f - b^2c(7de-4cf)) + 7abd(5de-2cf) \right)}{105d^3} \\
&= 2a^2e\sqrt{c+dx} + \frac{2f(a+bx)^2(c+dx)^{3/2}}{7d} + \frac{2(c+dx)^{3/2} \left(2(10a^2d^2f - b^2c(7de-4cf)) + 7abd(5de-2cf) \right)}{105d^3} \\
&= 2a^2e\sqrt{c+dx} + \frac{2f(a+bx)^2(c+dx)^{3/2}}{7d} + \frac{2(c+dx)^{3/2} \left(2(10a^2d^2f - b^2c(7de-4cf)) + 7abd(5de-2cf) \right)}{105d^3}
\end{aligned}$$

Mathematica [A] time = 0.17611, size = 145, normalized size = 0.99

$$\frac{2 \left(7de \left(\sqrt{c+dx} \left(15a^2d^2 + 10abd(c+dx) + b^2(-2c^2 + cdx + 3d^2x^2) \right) - 15a^2\sqrt{cd^2} \tanh^{-1} \left(\frac{\sqrt{c+dx}}{\sqrt{c}} \right) \right) + f(c+dx)^{3/2} (-42bd^2 + 10a^2d^2) \right)}{105d^3}$$

Antiderivative was successfully verified.

[In] Integrate(((a + b*x)^2*sqrt[c + d*x]*(e + f*x))/x,x)

[Out] (2*(f*(c + d*x)^(3/2)*(35*(b*c - a*d)^2 - 42*b*(b*c - a*d)*(c + d*x) + 15*b^2*(c + d*x)^2) + 7*d*e*(sqrt[c + d*x]*(15*a^2*d^2 + 10*a*b*d*(c + d*x) + b^2*(-2*c^2 + c*d*x + 3*d^2*x^2)) - 15*a^2*sqrt[c]*d^2*ArcTanh[sqrt[c + d*x]/sqrt[c]]))/105*d^3)

Maple [A] time = 0.008, size = 176, normalized size = 1.2

$$2 \frac{1}{d^3} \left(\frac{1}{7} b^2 f (dx + c)^{7/2} + \frac{2}{5} (dx + c)^{5/2} abdf - \frac{2}{5} (dx + c)^{5/2} b^2 cf + \frac{1}{5} (dx + c)^{5/2} b^2 de + \frac{1}{3} (dx + c)^{3/2} a^2 d^2 f - \frac{2}{3} a^2 d^2 e \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b*x+a)^2*(f*x+e)*(d*x+c)^(1/2)/x,x)

```
[Out] 2/d^3*(1/7*b^2*f*(d*x+c)^(7/2)+2/5*(d*x+c)^(5/2)*a*b*d*f-2/5*(d*x+c)^(5/2)*
b^2*c*f+1/5*(d*x+c)^(5/2)*b^2*d*e+1/3*(d*x+c)^(3/2)*a^2*d^2*f-2/3*(d*x+c)^(
3/2)*a*b*c*d*f+2/3*(d*x+c)^(3/2)*a*b*d^2*e+1/3*(d*x+c)^(3/2)*b^2*c^2*f-1/3*
(d*x+c)^(3/2)*b^2*c*d*e+a^2*d^3*e*(d*x+c)^(1/2)-a^2*c^(1/2)*d^3*e*arctanh((
d*x+c)^(1/2)/c^(1/2)))
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^2*(f*x+e)*(d*x+c)^(1/2)/x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 1.83759, size = 914, normalized size = 6.26

$$\left[\frac{105 a^2 \sqrt{cd^3} e \log\left(\frac{dx-2\sqrt{dx+c}\sqrt{c+2c}}{x}\right) + 2(15 b^2 d^3 f x^3 + 3(7 b^2 d^3 e + (b^2 c d^2 + 14 a b d^3) f) x^2 - 7(2 b^2 c^2 d - 10 a b c d^2 - 15 a^2 d^3) e + (8 b^2 c^3 - 28 a b c^2 d + 35 a^2 c d^2) f + (7(b^2 c d^2 + 10 a b d^3) e - (4 b^2 c^2 d - 14 a b c d^2 - 35 a^2 d^3) f) x) \sqrt{d x + c}}{105 d^3} \right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^2*(f*x+e)*(d*x+c)^(1/2)/x,x, algorithm="fricas")
```

```
[Out] [1/105*(105*a^2*sqrt(c)*d^3*e*log((d*x - 2*sqrt(d*x + c)*sqrt(c) + 2*c)/x)
+ 2*(15*b^2*d^3*f*x^3 + 3*(7*b^2*d^3*e + (b^2*c*d^2 + 14*a*b*d^3)*f)*x^2 -
7*(2*b^2*c^2*d - 10*a*b*c*d^2 - 15*a^2*d^3)*e + (8*b^2*c^3 - 28*a*b*c^2*d +
35*a^2*c*d^2)*f + (7*(b^2*c*d^2 + 10*a*b*d^3)*e - (4*b^2*c^2*d - 14*a*b*c*
d^2 - 35*a^2*d^3)*f)*x)*sqrt(d*x + c))/d^3, 2/105*(105*a^2*sqrt(-c)*d^3*e*a
rctan(sqrt(d*x + c)*sqrt(-c)/c) + (15*b^2*d^3*f*x^3 + 3*(7*b^2*d^3*e + (b^2
*c*d^2 + 14*a*b*d^3)*f)*x^2 - 7*(2*b^2*c^2*d - 10*a*b*c*d^2 - 15*a^2*d^3)*e
+ (8*b^2*c^3 - 28*a*b*c^2*d + 35*a^2*c*d^2)*f + (7*(b^2*c*d^2 + 10*a*b*d^3
)*e - (4*b^2*c^2*d - 14*a*b*c*d^2 - 35*a^2*d^3)*f)*x)*sqrt(d*x + c))/d^3]
```


Sympy [A] time = 18.8006, size = 167, normalized size = 1.14

$$\frac{2a^2ce \operatorname{atan}\left(\frac{\sqrt{c+dx}}{\sqrt{-c}}\right)}{\sqrt{-c}} + 2a^2e\sqrt{c+dx} + \frac{2b^2f(c+dx)^{\frac{7}{2}}}{7d^3} + \frac{2(c+dx)^{\frac{5}{2}}(2abdf - 2b^2cf + b^2de)}{5d^3} + \frac{2(c+dx)^{\frac{3}{2}}(a^2d^2f - 2abdf + b^2c^2)}{5d^3}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b*x+a)**2*(f*x+e)*(d*x+c)**(1/2)/x,x)

[Out] 2*a**2*c*e*atan(sqrt(c + d*x)/sqrt(-c))/sqrt(-c) + 2*a**2*e*sqrt(c + d*x) + 2*b**2*f*(c + d*x)**(7/2)/(7*d**3) + 2*(c + d*x)**(5/2)*(2*a*b*d*f - 2*b**2*c*f + b**2*d*e)/(5*d**3) + 2*(c + d*x)**(3/2)*(a**2*d**2*f - 2*a*b*c*d*f + 2*a*b*d**2*e + b**2*c**2*f - b**2*c*d*e)/(3*d**3)

Giac [A] time = 1.73379, size = 271, normalized size = 1.86

$$\frac{2a^2c \arctan\left(\frac{\sqrt{dx+c}}{\sqrt{-c}}\right)e}{\sqrt{-c}} + \frac{2\left(15(dx+c)^{\frac{7}{2}}b^2d^{18}f - 42(dx+c)^{\frac{5}{2}}b^2cd^{18}f + 35(dx+c)^{\frac{3}{2}}b^2c^2d^{18}f + 42(dx+c)^{\frac{5}{2}}abd^{19}f - 70(dx+c)^{\frac{3}{2}}a^2d^{20}f + 21(dx+c)^{\frac{5}{2}}b^2d^{19}e - 35(dx+c)^{\frac{3}{2}}b^2c^2d^{19}e + 70(dx+c)^{\frac{3}{2}}a^2bd^{20}e + 105\sqrt{dx+c}a^2d^{21}e\right)}{d^{21}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b*x+a)^2*(f*x+e)*(d*x+c)^(1/2)/x,x, algorithm="giac")

[Out] 2*a^2*c*arctan(sqrt(d*x + c)/sqrt(-c))*e/sqrt(-c) + 2/105*(15*(d*x + c)^(7/2)*b^2*d^18*f - 42*(d*x + c)^(5/2)*b^2*c*d^18*f + 35*(d*x + c)^(3/2)*b^2*c^2*d^18*f + 42*(d*x + c)^(5/2)*a*b*d^19*f - 70*(d*x + c)^(3/2)*a*b*c*d^19*f + 35*(d*x + c)^(3/2)*a^2*d^20*f + 21*(d*x + c)^(5/2)*b^2*d^19*e - 35*(d*x + c)^(3/2)*b^2*c^2*d^19*e + 70*(d*x + c)^(3/2)*a^2*b*d^20*e + 105*sqrt(d*x + c)*a^2*d^21*e)/d^21

3.10 $\int \frac{(a+bx)\sqrt{c+dx}(e+fx)}{x} dx$

Optimal. Leaf size=77

$$-\frac{2(c+dx)^{3/2}(-5d(af+be)+2bcf-3bdfx)}{15d^2} + 2ae\sqrt{c+dx} - 2a\sqrt{ce} \tanh^{-1}\left(\frac{\sqrt{c+dx}}{\sqrt{c}}\right)$$

[Out] $2*a*e*\text{Sqrt}[c + d*x] - (2*(c + d*x)^{(3/2)}*(2*b*c*f - 5*d*(b*e + a*f) - 3*b*d*f*x))/(15*d^2) - 2*a*\text{Sqrt}[c]*e*\text{ArcTanh}[\text{Sqrt}[c + d*x]/\text{Sqrt}[c]]$

Rubi [A] time = 0.0244644, antiderivative size = 77, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.174$, Rules used = {147, 50, 63, 208}

$$-\frac{2(c+dx)^{3/2}(-5d(af+be)+2bcf-3bdfx)}{15d^2} + 2ae\sqrt{c+dx} - 2a\sqrt{ce} \tanh^{-1}\left(\frac{\sqrt{c+dx}}{\sqrt{c}}\right)$$

Antiderivative was successfully verified.

[In] $\text{Int}[(a + b*x)*\text{Sqrt}[c + d*x]*(e + f*x))/x, x]$

[Out] $2*a*e*\text{Sqrt}[c + d*x] - (2*(c + d*x)^{(3/2)}*(2*b*c*f - 5*d*(b*e + a*f) - 3*b*d*f*x))/(15*d^2) - 2*a*\text{Sqrt}[c]*e*\text{ArcTanh}[\text{Sqrt}[c + d*x]/\text{Sqrt}[c]]$

Rule 147

$\text{Int}[(a + b*x)^m * (c + d*x)^n * (e + f*x), x] \rightarrow -\text{Simp}[(a*d*f*h*(n+2) + b*c*f*h*(m+2) - b*d*(f*g + e*h)*(m+n+3) - b*d*f*h*(m+n+2)*x]*(a + b*x)^{m+1}*(c + d*x)^{n+1}/(b^2*d^2*(m+n+2)*(m+n+3)), x] + \text{Dist}[(a^2*d^2*f*h*(n+1)*(n+2) + a*b*d*(n+1)*(2*c*f*h*(m+1) - d*(f*g + e*h)*(m+n+3)) + b^2*(c^2*f*h*(m+1)*(m+2) - c*d*(f*g + e*h)*(m+1)*(m+n+3) + d^2*e*g*(m+n+2)*(m+n+3))/(b^2*d^2*(m+n+2)*(m+n+3)), \text{Int}[(a + b*x)^m*(c + d*x)^n, x], x] /; \text{FreeQ}\{a, b, c, d, e, f, g, h, m, n\}, x] \&\& \text{NeQ}[m + n + 2, 0] \&\& \text{NeQ}[m + n + 3, 0]$

Rule 50

$\text{Int}[(a + b*x)^m * (c + d*x)^n, x] \rightarrow \text{Simp}[(a + b*x)^{m+1}*(c + d*x)^n/(b*(m+n+1)), x] + \text{Dist}[(n*(b*c - a*d))/$

```
(b*(m + n + 1)), Int[(a + b*x)^m*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0] && GtQ[n, 0] && NeQ[m + n + 1, 0] && !(IGtQ[m, 0] && (!IntegerQ[n] || (GtQ[m, 0] && LtQ[m - n, 0]))) && !ILtQ[m + n + 2, 0] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] := With[{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b + (d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Denominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] := Simp[(Rt[-(a/b), 2]*ArcTanh[x/Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rubi steps

$$\begin{aligned} \int \frac{(a + bx)\sqrt{c + dx}(e + fx)}{x} dx &= -\frac{2(c + dx)^{3/2}(2bcf - 5d(be + af) - 3bdfx)}{15d^2} + (ae) \int \frac{\sqrt{c + dx}}{x} dx \\ &= 2ae\sqrt{c + dx} - \frac{2(c + dx)^{3/2}(2bcf - 5d(be + af) - 3bdfx)}{15d^2} + (ace) \int \frac{1}{x\sqrt{c + dx}} dx \\ &= 2ae\sqrt{c + dx} - \frac{2(c + dx)^{3/2}(2bcf - 5d(be + af) - 3bdfx)}{15d^2} + \frac{(ace) \operatorname{Subst}\left(\int \frac{1}{-\frac{c}{a} + \frac{x^2}{a}} dx, \frac{c + dx}{d}\right)}{d} \\ &= 2ae\sqrt{c + dx} - \frac{2(c + dx)^{3/2}(2bcf - 5d(be + af) - 3bdfx)}{15d^2} - 2a\sqrt{ce} \tanh^{-1}\left(\frac{\sqrt{c + dx}}{\sqrt{c}}\right) \end{aligned}$$

Mathematica [A] time = 0.150035, size = 81, normalized size = 1.05

$$\frac{2\sqrt{c + dx}(5ad(cf + 3de + dfx) - b(c + dx)(2cf - 5de - 3dfx))}{15d^2} - 2a\sqrt{ce} \tanh^{-1}\left(\frac{\sqrt{c + dx}}{\sqrt{c}}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[((a + b*x)*Sqrt[c + d*x]*(e + f*x))/x,x]
```

[Out] $(2\sqrt{c + dx} * (-b(c + dx) * (-5de + 2cf - 3dfx)) + 5ad(3de + cf + dfx)) / (15d^2) - 2a\sqrt{c} * \text{ArcTanh}[\sqrt{c + dx} / \sqrt{c}]$

Maple [A] time = 0.006, size = 89, normalized size = 1.2

$$2 \frac{1}{d^2} \left(1/5 fb(dx + c)^{5/2} + 1/3 (dx + c)^{3/2} adf - 1/3 (dx + c)^{3/2} bcf + 1/3 (dx + c)^{3/2} bde + ad^2 e \sqrt{dx + c} - a \sqrt{cd^2} e \text{Arctanh} \left(\frac{\sqrt{dx + c}}{\sqrt{c}} \right) \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `int((b*x+a)*(f*x+e)*(d*x+c)^(1/2)/x,x)`

[Out] $2/d^2 * (1/5 * f * b * (d*x+c)^{5/2} + 1/3 * (d*x+c)^{3/2} * a * d * f - 1/3 * (d*x+c)^{3/2} * b * c * f + 1/3 * (d*x+c)^{3/2} * b * d * e + a * d^2 * e * (d*x+c)^{1/2} - a * c^{1/2} * d^2 * e * \text{arctanh}((d*x+c)^{1/2}/c^{1/2}))$

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((b*x+a)*(f*x+e)*(d*x+c)^(1/2)/x,x, algorithm="maxima")`

[Out] Exception raised: ValueError

Fricas [A] time = 1.349, size = 517, normalized size = 6.71

$$\left[\frac{15 a \sqrt{cd^2} e \log\left(\frac{dx - 2\sqrt{dx+c}\sqrt{c+2c}}{x}\right) + 2(3bd^2fx^2 + 5(bcd + 3ad^2)e - (2bc^2 - 5acd)f + (5bd^2e + (bcd + 5ad^2)f)x)\sqrt{dx+c}}{15d^2} \right]$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((b*x+a)*(f*x+e)*(d*x+c)^(1/2)/x,x, algorithm="fricas")`

[Out] $[1/15*(15*a*\sqrt{c}*d^2*e*\log((d*x - 2*\sqrt{d*x + c})*\sqrt{c} + 2*c)/x) + 2*(3*b*d^2*f*x^2 + 5*(b*c*d + 3*a*d^2)*e - (2*b*c^2 - 5*a*c*d)*f + (5*b*d^2*e + (b*c*d + 5*a*d^2)*f)*x)*\sqrt{d*x + c})/d^2, 2/15*(15*a*\sqrt{-c}*d^2*e*\arctan(\sqrt{d*x + c}*\sqrt{-c}/c) + (3*b*d^2*f*x^2 + 5*(b*c*d + 3*a*d^2)*e - (2*b*c^2 - 5*a*c*d)*f + (5*b*d^2*e + (b*c*d + 5*a*d^2)*f)*x)*\sqrt{d*x + c})/d^2]$

Sympy [A] time = 18.4181, size = 92, normalized size = 1.19

$$\frac{2ace \operatorname{atan}\left(\frac{\sqrt{c+dx}}{\sqrt{-c}}\right)}{\sqrt{-c}} + 2ae\sqrt{c+dx} + \frac{2bf(c+dx)^{\frac{5}{2}}}{5d^2} + \frac{2(c+dx)^{\frac{3}{2}}(adf - bcf + bde)}{3d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((b*x+a)*(f*x+e)*(d*x+c)**(1/2)/x,x)`

[Out] $2*a*c*e*\operatorname{atan}(\sqrt{c + d*x}/\sqrt{-c})/\sqrt{-c} + 2*a*e*\sqrt{c + d*x} + 2*b*f*(c + d*x)**(5/2)/(5*d**2) + 2*(c + d*x)**(3/2)*(a*d*f - b*c*f + b*d*e)/(3*d**2)$

Giac [A] time = 1.47718, size = 142, normalized size = 1.84

$$\frac{2ac \arctan\left(\frac{\sqrt{dx+c}}{\sqrt{-c}}\right)e}{\sqrt{-c}} + \frac{2\left(3(dx+c)^{\frac{5}{2}}bd^8f - 5(dx+c)^{\frac{3}{2}}bcd^8f + 5(dx+c)^{\frac{3}{2}}ad^9f + 5(dx+c)^{\frac{3}{2}}bd^9e + 15\sqrt{dx+c}ad^{10}e\right)}{15d^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((b*x+a)*(f*x+e)*(d*x+c)^(1/2)/x,x, algorithm="giac")`

[Out] $2*a*c*\arctan(\sqrt{d*x + c}/\sqrt{-c})*e/\sqrt{-c} + 2/15*(3*(d*x + c)^(5/2)*b*d^8*f - 5*(d*x + c)^(3/2)*b*c*d^8*f + 5*(d*x + c)^(3/2)*a*d^9*f + 5*(d*x + c)^(3/2)*b*d^9*e + 15*\sqrt{d*x + c}*a*d^10*e)/d^10$

3.11 $\int \frac{\sqrt{c+dx}(e+fx)}{x} dx$

Optimal. Leaf size=54

$$2e\sqrt{c+dx} - 2\sqrt{ce} \tanh^{-1}\left(\frac{\sqrt{c+dx}}{\sqrt{c}}\right) + \frac{2f(c+dx)^{3/2}}{3d}$$

[Out] $2e\sqrt{c+dx} + (2f*(c+dx)^{(3/2)})/(3*d) - 2\sqrt{c}*e*\text{ArcTanh}[\text{Sqrt}[c+dx]/\text{Sqrt}[c]]$

Rubi [A] time = 0.0165239, antiderivative size = 54, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}} = 0.222$, Rules used = {80, 50, 63, 208}

$$2e\sqrt{c+dx} - 2\sqrt{ce} \tanh^{-1}\left(\frac{\sqrt{c+dx}}{\sqrt{c}}\right) + \frac{2f(c+dx)^{3/2}}{3d}$$

Antiderivative was successfully verified.

[In] $\text{Int}[(\text{Sqrt}[c+dx]*(e+fx))/x,x]$

[Out] $2e\sqrt{c+dx} + (2f*(c+dx)^{(3/2)})/(3*d) - 2\sqrt{c}*e*\text{ArcTanh}[\text{Sqrt}[c+dx]/\text{Sqrt}[c]]$

Rule 80

$\text{Int}[(a_. + (b_.)*(x_.))*((c_.) + (d_.)*(x_.))^{(n_.)}*((e_.) + (f_.)*(x_.))^{(p_.)}, x_Symbol] \rightarrow \text{Simp}[(b*(c+dx)^{(n+1)}*(e+fx)^{(p+1)})/(d*f*(n+p+2)), x] + \text{Dist}[(a*d*f*(n+p+2) - b*(d*e*(n+1) + c*f*(p+1)))/(d*f*(n+p+2)), \text{Int}[(c+dx)^n*(e+fx)^p, x], x] /; \text{FreeQ}\{a, b, c, d, e, f, n, p\}, x \ \&\& \ \text{NeQ}[n+p+2, 0]$

Rule 50

$\text{Int}[(a_. + (b_.)*(x_.))^{(m_.)}*((c_.) + (d_.)*(x_.))^{(n_.)}, x_Symbol] \rightarrow \text{Simp}[(a+b*x)^{(m+1)}*(c+dx)^n/(b*(m+n+1)), x] + \text{Dist}[(n*(b*c - a*d))/(b*(m+n+1)), \text{Int}[(a+b*x)^m*(c+dx)^{(n-1)}, x], x] /; \text{FreeQ}\{a, b, c, d\}, x \ \&\& \ \text{NeQ}[b*c - a*d, 0] \ \&\& \ \text{GtQ}[n, 0] \ \&\& \ \text{NeQ}[m+n+1, 0] \ \&\& \ !(\text{IGtQ}[m, 0] \ \&\& \ (!\text{IntegerQ}[n] \ || \ (\text{GtQ}[m, 0] \ \&\& \ \text{LtQ}[m-n, 0]))) \ \&\& \ !\text{ILtQ}[m+n+2, 0] \ \&\& \ \text{IntLinearQ}[a, b, c, d, m, n, x]$

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] := With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_.) + (b_.)*(x_)^2)^(-1), x_Symbol] := Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rubi steps

$$\begin{aligned} \int \frac{\sqrt{c+dx}(e+fx)}{x} dx &= \frac{2f(c+dx)^{3/2}}{3d} + e \int \frac{\sqrt{c+dx}}{x} dx \\ &= 2e\sqrt{c+dx} + \frac{2f(c+dx)^{3/2}}{3d} + (ce) \int \frac{1}{x\sqrt{c+dx}} dx \\ &= 2e\sqrt{c+dx} + \frac{2f(c+dx)^{3/2}}{3d} + \frac{(ce) \operatorname{Subst}\left(\int \frac{1}{-\frac{c}{d} + \frac{x^2}{d}} dx, x, \sqrt{c+dx}\right)}{d} \\ &= 2e\sqrt{c+dx} + \frac{2f(c+dx)^{3/2}}{3d} - 2\sqrt{ce} \tanh^{-1}\left(\frac{\sqrt{c+dx}}{\sqrt{c}}\right) \end{aligned}$$

Mathematica [A] time = 0.0461209, size = 55, normalized size = 1.02

$$e \left(2\sqrt{c+dx} - 2\sqrt{c} \tanh^{-1}\left(\frac{\sqrt{c+dx}}{\sqrt{c}}\right) \right) + \frac{2f(c+dx)^{3/2}}{3d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(Sqrt[c + d*x]*(e + f*x))/x,x]
```

```
[Out] (2*f*(c + d*x)^(3/2))/(3*d) + e*(2*Sqrt[c + d*x] - 2*Sqrt[c]*ArcTanh[Sqrt[c
+ d*x]/Sqrt[c]])
```

Maple [A] time = 0.008, size = 46, normalized size = 0.9

$$2 \frac{1}{d} \left(\frac{1}{3} f (dx + c)^{3/2} + de\sqrt{dx + c} - \sqrt{c}de \operatorname{Artanh} \left(\frac{\sqrt{dx + c}}{\sqrt{c}} \right) \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((f*x+e)*(d*x+c)^(1/2)/x,x)

[Out] 2/d*(1/3*f*(d*x+c)^(3/2)+d*e*(d*x+c)^(1/2)-c^(1/2)*d*e*arctanh((d*x+c)^(1/2)/c^(1/2)))

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((f*x+e)*(d*x+c)^(1/2)/x,x, algorithm="maxima")

[Out] Exception raised: ValueError

Fricas [A] time = 1.32366, size = 279, normalized size = 5.17

$$\left[\frac{3 \sqrt{c}de \log \left(\frac{dx - 2\sqrt{dx+c}\sqrt{c} + 2c}{x} \right) + 2 (dfx + 3de + cf)\sqrt{dx + c}}{3d}, \frac{2 \left(3 \sqrt{-c}de \arctan \left(\frac{\sqrt{dx+c}\sqrt{-c}}{c} \right) + (dfx + 3de + cf)\sqrt{dx + c} \right)}{3d} \right]$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((f*x+e)*(d*x+c)^(1/2)/x,x, algorithm="fricas")

[Out] [1/3*(3*sqrt(c)*d*e*log((d*x - 2*sqrt(d*x + c)*sqrt(c) + 2*c)/x) + 2*(d*f*x + 3*d*e + c*f)*sqrt(d*x + c))/d, 2/3*(3*sqrt(-c)*d*e*arctan(sqrt(d*x + c)*sqrt(-c)/c) + (d*f*x + 3*d*e + c*f)*sqrt(d*x + c))/d]

Sympy [A] time = 3.87157, size = 54, normalized size = 1.

$$\frac{2ce \operatorname{atan}\left(\frac{\sqrt{c+dx}}{\sqrt{-c}}\right)}{\sqrt{-c}} + 2e\sqrt{c+dx} + \frac{2f(c+dx)^{\frac{3}{2}}}{3d}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((f*x+e)*(d*x+c)**(1/2)/x,x)

[Out] 2*c*e*atan(sqrt(c + d*x)/sqrt(-c))/sqrt(-c) + 2*e*sqrt(c + d*x) + 2*f*(c + d*x)**(3/2)/(3*d)

Giac [A] time = 1.53136, size = 77, normalized size = 1.43

$$\frac{2c \arctan\left(\frac{\sqrt{dx+c}}{\sqrt{-c}}\right)e}{\sqrt{-c}} + \frac{2\left((dx+c)^{\frac{3}{2}}d^2f + 3\sqrt{dx+c}d^3e\right)}{3d^3}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((f*x+e)*(d*x+c)^(1/2)/x,x, algorithm="giac")

[Out] 2*c*arctan(sqrt(d*x + c)/sqrt(-c))*e/sqrt(-c) + 2/3*((d*x + c)^(3/2)*d^2*f + 3*sqrt(d*x + c)*d^3*e)/d^3

$$3.12 \quad \int \frac{\sqrt{c+dx}(e+fx)}{x(a+bx)} dx$$

Optimal. Leaf size=101

$$\frac{2\sqrt{bc-ad}(be-af) \tanh^{-1}\left(\frac{\sqrt{b}\sqrt{c+dx}}{\sqrt{bc-ad}}\right)}{ab^{3/2}} - \frac{2\sqrt{ce} \tanh^{-1}\left(\frac{\sqrt{c+dx}}{\sqrt{c}}\right)}{a} + \frac{2f\sqrt{c+dx}}{b}$$

[Out] (2*f*Sqrt[c + d*x])/b - (2*Sqrt[c]*e*ArcTanh[Sqrt[c + d*x]/Sqrt[c]])/a + (2*Sqrt[b*c - a*d]*(b*e - a*f)*ArcTanh[(Sqrt[b]*Sqrt[c + d*x])/Sqrt[b*c - a*d]])/(a*b^(3/2))

Rubi [A] time = 0.113531, antiderivative size = 101, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 4, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.16$, Rules used = {154, 156, 63, 208}

$$\frac{2\sqrt{bc-ad}(be-af) \tanh^{-1}\left(\frac{\sqrt{b}\sqrt{c+dx}}{\sqrt{bc-ad}}\right)}{ab^{3/2}} - \frac{2\sqrt{ce} \tanh^{-1}\left(\frac{\sqrt{c+dx}}{\sqrt{c}}\right)}{a} + \frac{2f\sqrt{c+dx}}{b}$$

Antiderivative was successfully verified.

[In] Int[(Sqrt[c + d*x]*(e + f*x))/(x*(a + b*x)),x]

[Out] (2*f*Sqrt[c + d*x])/b - (2*Sqrt[c]*e*ArcTanh[Sqrt[c + d*x]/Sqrt[c]])/a + (2*Sqrt[b*c - a*d]*(b*e - a*f)*ArcTanh[(Sqrt[b]*Sqrt[c + d*x])/Sqrt[b*c - a*d]])/(a*b^(3/2))

Rule 154

Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_)*((e_.) + (f_.)*(x_))^(p_)*((g_.) + (h_.)*(x_)), x_Symbol] := Simp[(h*(a + b*x)^(m*(c + d*x)^(n + 1)*(e + f*x)^(p + 1))/(d*f*(m + n + p + 2)), x] + Dist[1/(d*f*(m + n + p + 2)), Int[(a + b*x)^(m - 1)*(c + d*x)^(n*(e + f*x)^p*Simp[a*d*f*g*(m + n + p + 2) - h*(b*c*e*m + a*(d*e*(n + 1) + c*f*(p + 1))) + (b*d*f*g*(m + n + p + 2) + h*(a*d*f*m - b*(d*e*(m + n + 1) + c*f*(m + p + 1)))]*x, x], x] / ; FreeQ[{a, b, c, d, e, f, g, h, n, p}, x] && GtQ[m, 0] && NeQ[m + n + p + 2, 0] && IntegersQ[2*m, 2*n, 2*p]

Rule 156

Int[(((e_.) + (f_.)*(x_))^(p_)*((g_.) + (h_.)*(x_)))/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] := Dist[(b*g - a*h)/(b*c - a*d), Int[(e +

$f*x^p/(a + b*x), x], x] - \text{Dist}[(d*g - c*h)/(b*c - a*d), \text{Int}[(e + f*x)^p/(c + d*x), x], x] /; \text{FreeQ}\{a, b, c, d, e, f, g, h\}, x]$

Rule 63

$\text{Int}[(a_. + (b_.)*(x_.))^{(m_.)}*((c_.) + (d_.)*(x_.))^{(n_.)}, x_Symbol] := \text{With}[\{p = \text{Denominator}[m]\}, \text{Dist}[p/b, \text{Subst}[\text{Int}[x^{(p*(m + 1) - 1)}*(c - (a*d)/b + (d*x^p)/b)^n, x], x, (a + b*x)^{(1/p)}], x]] /; \text{FreeQ}\{a, b, c, d\}, x] \&\& \text{NeQ}[b*c - a*d, 0] \&\& \text{LtQ}[-1, m, 0] \&\& \text{LeQ}[-1, n, 0] \&\& \text{LeQ}[\text{Denominator}[n], \text{Denominator}[m]] \&\& \text{IntLinearQ}[a, b, c, d, m, n, x]$

Rule 208

$\text{Int}[(a_. + (b_.)*(x_.)^2)^{-1}, x_Symbol] := \text{Simp}[(\text{Rt}[-(a/b), 2]*\text{ArcTanh}[x/\text{Rt}[-(a/b), 2]])/a, x] /; \text{FreeQ}\{a, b\}, x] \&\& \text{NegQ}[a/b]$

Rubi steps

$$\begin{aligned} \int \frac{\sqrt{c+dx}(e+fx)}{x(a+bx)} dx &= \frac{2f\sqrt{c+dx}}{b} + \frac{2 \int \frac{\frac{bce}{2} + \frac{1}{2}(bde+bcf-adf)x}{x(a+bx)\sqrt{c+dx}} dx}{b} \\ &= \frac{2f\sqrt{c+dx}}{b} + \frac{(ce) \int \frac{1}{x\sqrt{c+dx}} dx}{a} - \frac{((bc-ad)(be-af)) \int \frac{1}{(a+bx)\sqrt{c+dx}} dx}{ab} \\ &= \frac{2f\sqrt{c+dx}}{b} + \frac{(2ce) \text{Subst}\left(\int \frac{1}{-\frac{c}{a} + \frac{x^2}{a}} dx, x, \sqrt{c+dx}\right)}{ad} - \frac{(2(bc-ad)(be-af)) \text{Subst}\left(\int \frac{1}{a - \frac{bc}{a} + \frac{bx^2}{a}} dx, x, \sqrt{c+dx}\right)}{abd} \\ &= \frac{2f\sqrt{c+dx}}{b} - \frac{2\sqrt{ce} \tanh^{-1}\left(\frac{\sqrt{c+dx}}{\sqrt{c}}\right)}{a} + \frac{2\sqrt{bc-ad}(be-af) \tanh^{-1}\left(\frac{\sqrt{b}\sqrt{c+dx}}{\sqrt{bc-ad}}\right)}{ab^{3/2}} \end{aligned}$$

Mathematica [A] time = 0.114611, size = 101, normalized size = 1.

$$\frac{2\sqrt{bc-ad}(be-af) \tanh^{-1}\left(\frac{\sqrt{b}\sqrt{c+dx}}{\sqrt{bc-ad}}\right)}{ab^{3/2}} - \frac{2\sqrt{ce} \tanh^{-1}\left(\frac{\sqrt{c+dx}}{\sqrt{c}}\right)}{a} + \frac{2f\sqrt{c+dx}}{b}$$

Antiderivative was successfully verified.

[In] Integrate[(Sqrt[c + d*x]*(e + f*x))/(x*(a + b*x)), x]

[Out] $(2*f*\sqrt{c + d*x})/b - (2*\sqrt{c}*e*\text{ArcTanh}[\sqrt{c + d*x}/\sqrt{c}])/a + (2*\sqrt{b*c - a*d}*(b*e - a*f)*\text{ArcTanh}[(\sqrt{b}*\sqrt{c + d*x})/\sqrt{b*c - a*d}])/ (a*b^{(3/2)})$

Maple [B] time = 0.011, size = 196, normalized size = 1.9

$$2 \frac{f\sqrt{dx+c}}{b} - 2 \frac{e\sqrt{c}}{a} \text{Artanh}\left(\frac{\sqrt{dx+c}}{\sqrt{c}}\right) - 2 \frac{adf}{b\sqrt{(ad-bc)b}} \arctan\left(\frac{b\sqrt{dx+c}}{\sqrt{(ad-bc)b}}\right) + 2 \frac{cf}{\sqrt{(ad-bc)b}} \arctan\left(\frac{b\sqrt{dx+c}}{\sqrt{(ad-bc)b}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `int((f*x+e)*(d*x+c)^(1/2)/x/(b*x+a),x)`

[Out] $2*f*(d*x+c)^{(1/2)}/b - 2*e*\arctanh((d*x+c)^{(1/2)}/c^{(1/2)})*c^{(1/2)}/a - 2*a/b/((a*d-b*c)*b)^{(1/2)}*\arctan(b*(d*x+c)^{(1/2)}/((a*d-b*c)*b)^{(1/2)})*d*f + 2/((a*d-b*c)*b)^{(1/2)}*\arctan(b*(d*x+c)^{(1/2)}/((a*d-b*c)*b)^{(1/2)})*c*f + 2/((a*d-b*c)*b)^{(1/2)}*\arctan(b*(d*x+c)^{(1/2)}/((a*d-b*c)*b)^{(1/2)})*d*e - 2/a*b/((a*d-b*c)*b)^{(1/2)}*\arctan(b*(d*x+c)^{(1/2)}/((a*d-b*c)*b)^{(1/2)})*c*e$

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((f*x+e)*(d*x+c)^(1/2)/x/(b*x+a),x, algorithm="maxima")`

[Out] Exception raised: ValueError

Fricas [A] time = 1.69275, size = 1013, normalized size = 10.03

$$\left[\frac{b\sqrt{ce} \log\left(\frac{dx-2\sqrt{dx+c}\sqrt{c+2c}}{x}\right) + 2\sqrt{dx+ca}f - (be-af)\sqrt{\frac{bc-ad}{b}} \log\left(\frac{bdx+2bc-ad-2\sqrt{dx+cb}\sqrt{\frac{bc-ad}{b}}}{bx+a}\right)}{ab}, b\sqrt{ce} \log\left(\frac{dx-2\sqrt{dx+c}\sqrt{c+2c}}{x}\right) \right]$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((f*x+e)*(d*x+c)^(1/2)/x/(b*x+a),x, algorithm="fricas")

[Out] [(b*sqrt(c)*e*log((d*x - 2*sqrt(d*x + c)*sqrt(c) + 2*c)/x) + 2*sqrt(d*x + c)*a*f - (b*e - a*f)*sqrt((b*c - a*d)/b)*log((b*d*x + 2*b*c - a*d - 2*sqrt(d*x + c)*b*sqrt((b*c - a*d)/b))/(b*x + a)))/(a*b), (b*sqrt(c)*e*log((d*x - 2*sqrt(d*x + c)*sqrt(c) + 2*c)/x) + 2*sqrt(d*x + c)*a*f + 2*(b*e - a*f)*sqrt(-(b*c - a*d)/b)*arctan(-sqrt(d*x + c)*b*sqrt(-(b*c - a*d)/b)/(b*c - a*d)))/(a*b), (2*b*sqrt(-c)*e*arctan(sqrt(d*x + c)*sqrt(-c)/c) + 2*sqrt(d*x + c)*a*f - (b*e - a*f)*sqrt((b*c - a*d)/b)*log((b*d*x + 2*b*c - a*d - 2*sqrt(d*x + c)*b*sqrt((b*c - a*d)/b))/(b*x + a)))/(a*b), 2*(b*sqrt(-c)*e*arctan(sqrt(d*x + c)*sqrt(-c)/c) + sqrt(d*x + c)*a*f + (b*e - a*f)*sqrt(-(b*c - a*d)/b)*arctan(-sqrt(d*x + c)*b*sqrt(-(b*c - a*d)/b)/(b*c - a*d)))/(a*b)]

Sympy [A] time = 17.0919, size = 97, normalized size = 0.96

$$\frac{2f\sqrt{c+dx}}{b} + \frac{2ce \operatorname{atan}\left(\frac{\sqrt{c+dx}}{\sqrt{-c}}\right)}{a\sqrt{-c}} - \frac{2(ad-bc)(af-be) \operatorname{atan}\left(\frac{\sqrt{c+dx}}{\sqrt{\frac{ad-bc}{b}}}\right)}{ab^2\sqrt{\frac{ad-bc}{b}}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((f*x+e)*(d*x+c)**(1/2)/x/(b*x+a),x)

[Out] 2*f*sqrt(c + d*x)/b + 2*c*e*atan(sqrt(c + d*x)/sqrt(-c))/(a*sqrt(-c)) - 2*(a*d - b*c)*(a*f - b*e)*atan(sqrt(c + d*x)/sqrt((a*d - b*c)/b))/(a*b**2*sqrt((a*d - b*c)/b))

Giac [A] time = 1.43571, size = 151, normalized size = 1.5

$$\frac{2c \operatorname{arctan}\left(\frac{\sqrt{dx+c}}{\sqrt{-c}}\right)e}{a\sqrt{-c}} + \frac{2\sqrt{dx+cf}}{b} + \frac{2(abc f - a^2 d f - b^2 c e + abde) \operatorname{arctan}\left(\frac{\sqrt{dx+cb}}{\sqrt{-b^2c+abd}}\right)}{\sqrt{-b^2c+abd}ab}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((f*x+e)*(d*x+c)^(1/2)/x/(b*x+a),x, algorithm="giac")

[Out] 2*c*arctan(sqrt(d*x + c)/sqrt(-c))*e/(a*sqrt(-c)) + 2*sqrt(d*x + c)*f/b + 2*(a*b*c*f - a^2*d*f - b^2*c*e + a*b*d*e)*arctan(sqrt(d*x + c)*b/sqrt(-b^2*c

$$+ a*b*d)/(sqrt(-b^2*c + a*b*d)*a*b)$$

$$3.13 \quad \int \frac{\sqrt{c+dx}(e+fx)}{x(a+bx)^2} dx$$

Optimal. Leaf size=127

$$\frac{(2b^2ce - ad(af + be)) \tanh^{-1}\left(\frac{\sqrt{b}\sqrt{c+dx}}{\sqrt{bc-ad}}\right)}{a^2b^{3/2}\sqrt{bc-ad}} - \frac{2\sqrt{ce} \tanh^{-1}\left(\frac{\sqrt{c+dx}}{\sqrt{c}}\right)}{a^2} + \frac{\sqrt{c+dx}(be - af)}{ab(a+bx)}$$

[Out] ((b*e - a*f)*Sqrt[c + d*x])/(a*b*(a + b*x)) - (2*Sqrt[c]*e*ArcTanh[Sqrt[c + d*x]/Sqrt[c]])/a^2 + ((2*b^2*c*e - a*d*(b*e + a*f))*ArcTanh[(Sqrt[b]*Sqrt[c + d*x])/Sqrt[b*c - a*d]])/(a^2*b^(3/2)*Sqrt[b*c - a*d])

Rubi [A] time = 0.109307, antiderivative size = 127, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 4, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.16$, Rules used = {149, 156, 63, 208}

$$\frac{(2b^2ce - ad(af + be)) \tanh^{-1}\left(\frac{\sqrt{b}\sqrt{c+dx}}{\sqrt{bc-ad}}\right)}{a^2b^{3/2}\sqrt{bc-ad}} - \frac{2\sqrt{ce} \tanh^{-1}\left(\frac{\sqrt{c+dx}}{\sqrt{c}}\right)}{a^2} + \frac{\sqrt{c+dx}(be - af)}{ab(a+bx)}$$

Antiderivative was successfully verified.

[In] Int[(Sqrt[c + d*x]*(e + f*x))/(x*(a + b*x)^2), x]

[Out] ((b*e - a*f)*Sqrt[c + d*x])/(a*b*(a + b*x)) - (2*Sqrt[c]*e*ArcTanh[Sqrt[c + d*x]/Sqrt[c]])/a^2 + ((2*b^2*c*e - a*d*(b*e + a*f))*ArcTanh[(Sqrt[b]*Sqrt[c + d*x])/Sqrt[b*c - a*d]])/(a^2*b^(3/2)*Sqrt[b*c - a*d])

Rule 149

Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_)*((e_.) + (f_.)*(x_))^(p_)*((g_.) + (h_.)*(x_)), x_Symbol] :> Simp[((b*g - a*h)*(a + b*x)^(m + 1)*(c + d*x)^n*(e + f*x)^(p + 1))/(b*(b*e - a*f)*(m + 1)), x] - Dist[1/(b*(b*e - a*f)*(m + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^(n - 1)*(e + f*x)^p*Simp[b*c*(f*g - e*h)*(m + 1) + (b*g - a*h)*(d*e*n + c*f*(p + 1)) + d*(b*(f*g - e*h)*(m + 1) + f*(b*g - a*h)*(n + p + 1))*x, x], x] /; FreeQ[{a, b, c, d, e, f, g, h, p}, x] && LtQ[m, -1] && GtQ[n, 0] && IntegerQ[m]

Rule 156

Int[(((e_.) + (f_.)*(x_))^(p_)*((g_.) + (h_.)*(x_)))/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[(b*g - a*h)/(b*c - a*d), Int[(e +

$f*x)^p/(a + b*x), x], x] - \text{Dist}[(d*g - c*h)/(b*c - a*d), \text{Int}[(e + f*x)^p/(c + d*x), x], x] /; \text{FreeQ}\{a, b, c, d, e, f, g, h\}, x]$

Rule 63

$\text{Int}[(a_. + (b_.)*(x_)^(m_))*((c_.) + (d_.)*(x_)^(n_)), x_Symbol] := \text{With}[\{p = \text{Denominator}[m]\}, \text{Dist}[p/b, \text{Subst}[\text{Int}[x^(p*(m + 1) - 1)*(c - (a*d)/b + (d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; \text{FreeQ}\{a, b, c, d\}, x] \&\& \text{NeQ}[b*c - a*d, 0] \&\& \text{LtQ}[-1, m, 0] \&\& \text{LeQ}[-1, n, 0] \&\& \text{LeQ}[\text{Denominator}[n], \text{Denominator}[m]] \&\& \text{IntLinearQ}[a, b, c, d, m, n, x]$

Rule 208

$\text{Int}[(a_. + (b_.)*(x_)^2)^(-1), x_Symbol] := \text{Simp}[(\text{Rt}[-(a/b), 2]*\text{ArcTanh}[x/\text{Rt}[-(a/b), 2]])/a, x] /; \text{FreeQ}\{a, b\}, x] \&\& \text{NegQ}[a/b]$

Rubi steps

$$\begin{aligned} \int \frac{\sqrt{c+dx}(e+fx)}{x(a+bx)^2} dx &= \frac{(be-af)\sqrt{c+dx}}{ab(a+bx)} - \frac{\int \frac{-bce - \frac{1}{2}d(be+af)x}{x(a+bx)\sqrt{c+dx}} dx}{ab} \\ &= \frac{(be-af)\sqrt{c+dx}}{ab(a+bx)} + \frac{(ce) \int \frac{1}{x\sqrt{c+dx}} dx}{a^2} + \frac{\left(-b^2ce + \frac{1}{2}ad(be+af)\right) \int \frac{1}{(a+bx)\sqrt{c+dx}} dx}{a^2b} \\ &= \frac{(be-af)\sqrt{c+dx}}{ab(a+bx)} + \frac{(2ce) \text{Subst}\left(\int \frac{1}{-\frac{c}{a} + \frac{x^2}{d}} dx, x, \sqrt{c+dx}\right)}{a^2d} + \frac{\left(2\left(-b^2ce + \frac{1}{2}ad(be+af)\right)\right) \text{Subst}}{a^2bd} \\ &= \frac{(be-af)\sqrt{c+dx}}{ab(a+bx)} - \frac{2\sqrt{ce} \tanh^{-1}\left(\frac{\sqrt{c+dx}}{\sqrt{c}}\right)}{a^2} + \frac{(2b^2ce - ad(be+af)) \tanh^{-1}\left(\frac{\sqrt{b}\sqrt{c+dx}}{\sqrt{bc-ad}}\right)}{a^2b^{3/2}\sqrt{bc-ad}} \end{aligned}$$

Mathematica [A] time = 0.468364, size = 124, normalized size = 0.98

$$\frac{\frac{(a^2df+abde-2b^2ce) \tanh^{-1}\left(\frac{\sqrt{b}\sqrt{c+dx}}{\sqrt{bc-ad}}\right)}{b^{3/2}\sqrt{bc-ad}} + \frac{a\sqrt{c+dx}(be-af)}{b(a+bx)} - 2\sqrt{ce} \tanh^{-1}\left(\frac{\sqrt{c+dx}}{\sqrt{c}}\right)}{a^2}$$

Antiderivative was successfully verified.

[In] Integrate[(Sqrt[c + d*x]*(e + f*x))/(x*(a + b*x)^2), x]


```
[Out] ((a*(b*e - a*f)*Sqrt[c + d*x])/(b*(a + b*x)) - 2*Sqrt[c]*e*ArcTanh[Sqrt[c +
d*x]/Sqrt[c]] - ((-2*b^2*c*e + a*b*d*e + a^2*d*f)*ArcTanh[(Sqrt[b]*Sqrt[c
+ d*x])/Sqrt[b*c - a*d]])/(b^(3/2)*Sqrt[b*c - a*d]))/a^2
```

Maple [A] time = 0.013, size = 192, normalized size = 1.5

$$-2 \frac{e\sqrt{c}}{a^2} \operatorname{Arctanh}\left(\frac{\sqrt{dx+c}}{\sqrt{c}}\right) - \frac{df}{b(bdx+ad)} \sqrt{dx+c} + \frac{de}{a(bdx+ad)} \sqrt{dx+c} + \frac{df}{b} \arctan\left(b\sqrt{dx+c} \frac{1}{\sqrt{(ad-bc)b}}\right) \frac{1}{\sqrt{ad-bc}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x+e)*(d*x+c)^(1/2)/x/(b*x+a)^2,x)
```

```
[Out] -2*e*arctanh((d*x+c)^(1/2)/c^(1/2))*c^(1/2)/a^2-d/b*(d*x+c)^(1/2)/(b*d*x+a*
d)*f+d/a*(d*x+c)^(1/2)/(b*d*x+a*d)*e+d/b/((a*d-b*c)*b)^(1/2)*arctan(b*(d*x+
c)^(1/2)/((a*d-b*c)*b)^(1/2))*f+d/a/((a*d-b*c)*b)^(1/2)*arctan(b*(d*x+c)^(1
/2)/((a*d-b*c)*b)^(1/2))*e-2/a^2*b/((a*d-b*c)*b)^(1/2)*arctan(b*(d*x+c)^(1/
2)/((a*d-b*c)*b)^(1/2))*c*e
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)*(d*x+c)^(1/2)/x/(b*x+a)^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [B] time = 1.91043, size = 2114, normalized size = 16.65

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)*(d*x+c)^(1/2)/x/(b*x+a)^2,x, algorithm="fricas")
```

```
[Out] [1/2*((a^3*d*f - (2*a*b^2*c - a^2*b*d)*e + (a^2*b*d*f - (2*b^3*c - a*b^2*d)*e)*x)*sqrt(b^2*c - a*b*d)*log((b*d*x + 2*b*c - a*d - 2*sqrt(b^2*c - a*b*d)*sqrt(d*x + c))/(b*x + a)) + 2*((b^4*c - a*b^3*d)*e*x + (a*b^3*c - a^2*b^2*d)*e)*sqrt(c)*log((d*x - 2*sqrt(d*x + c)*sqrt(c) + 2*c)/x) + 2*((a*b^3*c - a^2*b^2*d)*e - (a^2*b^2*c - a^3*b*d)*f)*sqrt(d*x + c)/(a^3*b^3*c - a^4*b^2*d + (a^2*b^4*c - a^3*b^3*d)*x), ((a^3*d*f - (2*a*b^2*c - a^2*b*d)*e + (a^2*b*d*f - (2*b^3*c - a*b^2*d)*e)*x)*sqrt(-b^2*c + a*b*d)*arctan(sqrt(-b^2*c + a*b*d)*sqrt(d*x + c)/(b*d*x + b*c)) + ((b^4*c - a*b^3*d)*e*x + (a*b^3*c - a^2*b^2*d)*e)*sqrt(c)*log((d*x - 2*sqrt(d*x + c)*sqrt(c) + 2*c)/x) + ((a*b^3*c - a^2*b^2*d)*e - (a^2*b^2*c - a^3*b*d)*f)*sqrt(d*x + c)/(a^3*b^3*c - a^4*b^2*d + (a^2*b^4*c - a^3*b^3*d)*x), 1/2*(4*((b^4*c - a*b^3*d)*e*x + (a*b^3*c - a^2*b^2*d)*e)*sqrt(-c)*arctan(sqrt(d*x + c)*sqrt(-c)/c) + (a^3*d*f - (2*a*b^2*c - a^2*b*d)*e + (a^2*b*d*f - (2*b^3*c - a*b^2*d)*e)*x)*sqrt(b^2*c - a*b*d)*log((b*d*x + 2*b*c - a*d - 2*sqrt(b^2*c - a*b*d)*sqrt(d*x + c))/(b*x + a)) + 2*((a*b^3*c - a^2*b^2*d)*e - (a^2*b^2*c - a^3*b*d)*f)*sqrt(d*x + c)/(a^3*b^3*c - a^4*b^2*d + (a^2*b^4*c - a^3*b^3*d)*x), ((a^3*d*f - (2*a*b^2*c - a^2*b*d)*e + (a^2*b*d*f - (2*b^3*c - a*b^2*d)*e)*x)*sqrt(-b^2*c + a*b*d)*arctan(sqrt(-b^2*c + a*b*d)*sqrt(d*x + c)/(b*d*x + b*c)) + 2*((b^4*c - a*b^3*d)*e*x + (a*b^3*c - a^2*b^2*d)*e)*sqrt(-c)*arctan(sqrt(d*x + c)*sqrt(-c)/c) + ((a*b^3*c - a^2*b^2*d)*e - (a^2*b^2*c - a^3*b*d)*f)*sqrt(d*x + c)/(a^3*b^3*c - a^4*b^2*d + (a^2*b^4*c - a^3*b^3*d)*x)]
```

Sympy [B] time = 52.5411, size = 1204, normalized size = 9.48

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)*(d*x+c)**(1/2)/x/(b*x+a)**2,x)
```

```
[Out] -2*a*d**2*f*sqrt(c + d*x)/(2*a**2*b*d**2 - 2*a*b**2*c*d + 2*a*b**2*d**2*x - 2*b**3*c*d*x) + a*d**2*f*sqrt(-1/(b*(a*d - b*c)**3))*log(-a**2*d**2*sqrt(-1/(b*(a*d - b*c)**3)) + 2*a*b*c*d*sqrt(-1/(b*(a*d - b*c)**3)) - b**2*c**2*sqrt(-1/(b*(a*d - b*c)**3)) + sqrt(c + d*x))/(2*b) - a*d**2*f*sqrt(-1/(b*(a*d - b*c)**3))*log(a**2*d**2*sqrt(-1/(b*(a*d - b*c)**3)) - 2*a*b*c*d*sqrt(-1/(b*(a*d - b*c)**3)) + b**2*c**2*sqrt(-1/(b*(a*d - b*c)**3)) + sqrt(c + d*x))/(2*b) - 2*b*c*d*e*sqrt(c + d*x)/(2*a**3*d**2 - 2*a**2*b*c*d + 2*a**2*b*d**2*x - 2*a*b**2*c*d*x) - c*d*f*sqrt(-1/(b*(a*d - b*c)**3))*log(-a**2*d**2*sqrt(-1/(b*(a*d - b*c)**3)) + 2*a*b*c*d*sqrt(-1/(b*(a*d - b*c)**3)) - b**2*c**2*sqrt(-1/(b*(a*d - b*c)**3)) + sqrt(c + d*x))/2 + c*d*f*sqrt(-1/(b*(a*d - b*c)**3))*log(a**2*d**2*sqrt(-1/(b*(a*d - b*c)**3)) - 2*a*b*c*d*sqrt(-1/(b*(a*d - b*c)**3)) + b**2*c**2*sqrt(-1/(b*(a*d - b*c)**3)) + sqrt(c + d*x)
```

```

)/2 + 2*c*d*f*sqrt(c + d*x)/(2*a**2*d**2 - 2*a*b*c*d + 2*a*b*d**2*x - 2*b**
2*c*d*x) - d**2*e*sqrt(-1/(b*(a*d - b*c)**3))*log(-a**2*d**2*sqrt(-1/(b*(a*
d - b*c)**3)) + 2*a*b*c*d*sqrt(-1/(b*(a*d - b*c)**3)) - b**2*c**2*sqrt(-1/(
b*(a*d - b*c)**3)) + sqrt(c + d*x))/2 + d**2*e*sqrt(-1/(b*(a*d - b*c)**3))*
log(a**2*d**2*sqrt(-1/(b*(a*d - b*c)**3)) - 2*a*b*c*d*sqrt(-1/(b*(a*d - b*c
)**3)) + b**2*c**2*sqrt(-1/(b*(a*d - b*c)**3)) + sqrt(c + d*x))/2 + 2*d**2*
e*sqrt(c + d*x)/(2*a**2*d**2 - 2*a*b*c*d + 2*a*b*d**2*x - 2*b**2*c*d*x) + 2
*d*f*atan(sqrt(c + d*x)/sqrt(a*d/b - c))/(b**2*sqrt(a*d/b - c)) + b*c*d*e*s
qrt(-1/(b*(a*d - b*c)**3))*log(-a**2*d**2*sqrt(-1/(b*(a*d - b*c)**3)) + 2*a
*b*c*d*sqrt(-1/(b*(a*d - b*c)**3)) - b**2*c**2*sqrt(-1/(b*(a*d - b*c)**3))
+ sqrt(c + d*x))/(2*a) - b*c*d*e*sqrt(-1/(b*(a*d - b*c)**3))*log(a**2*d**2*
sqrt(-1/(b*(a*d - b*c)**3)) - 2*a*b*c*d*sqrt(-1/(b*(a*d - b*c)**3)) + b**2*
c**2*sqrt(-1/(b*(a*d - b*c)**3)) + sqrt(c + d*x))/(2*a) - 2*c*e*atan(sqrt(c
+ d*x)/sqrt(a*d/b - c))/(a**2*sqrt(a*d/b - c)) + 2*c*e*atan(sqrt(c + d*x)/
sqrt(-c))/(a**2*sqrt(-c))

```

Giac [A] time = 1.67258, size = 192, normalized size = 1.51

$$\frac{2c \arctan\left(\frac{\sqrt{dx+c}}{\sqrt{-c}}\right)e}{a^2\sqrt{-c}} + \frac{(a^2df - 2b^2ce + abde) \arctan\left(\frac{\sqrt{dx+cb}}{\sqrt{-b^2c+abd}}\right)}{\sqrt{-b^2c+ab}a^2b} - \frac{\sqrt{dx+cadf} - \sqrt{dx+cbde}}{((dx+c)b - bc + ad)ab}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((f*x+e)*(d*x+c)^(1/2)/x/(b*x+a)^2,x, algorithm="giac")

[Out] 2*c*arctan(sqrt(d*x + c)/sqrt(-c))*e/(a^2*sqrt(-c)) + (a^2*d*f - 2*b^2*c*e + a*b*d*e)*arctan(sqrt(d*x + c)*b/sqrt(-b^2*c + a*b*d))/(sqrt(-b^2*c + a*b*d)*a^2*b) - (sqrt(d*x + c)*a*d*f - sqrt(d*x + c)*b*d*e)/(((d*x + c)*b - b*c + a*d)*a*b)

$$3.14 \quad \int \frac{\sqrt{c+dx}(e+fx)}{x(a+bx)^3} dx$$

Optimal. Leaf size=208

$$\frac{(3a^2bd^2e + a^3d^2f - 12ab^2cde + 8b^3c^2e) \tanh^{-1}\left(\frac{\sqrt{b}\sqrt{c+dx}}{\sqrt{bc-ad}}\right)}{4a^3b^{3/2}(bc-ad)^{3/2}} + \frac{\sqrt{c+dx}(a^2(-d)f - 3abde + 4b^2ce)}{4a^2b(a+bx)(bc-ad)} - \frac{2\sqrt{ce} \tanh^{-1}\left(\frac{\sqrt{c+dx}}{\sqrt{c}}\right)}{a^3}$$

[Out] ((b*e - a*f)*Sqrt[c + d*x])/(2*a*b*(a + b*x)^2) + ((4*b^2*c*e - 3*a*b*d*e - a^2*d*f)*Sqrt[c + d*x])/(4*a^2*b*(b*c - a*d)*(a + b*x)) - (2*Sqrt[c]*e*ArcTanh[Sqrt[c + d*x]/Sqrt[c]])/a^3 + ((8*b^3*c^2*e - 12*a*b^2*c*d*e + 3*a^2*b*d^2*e + a^3*d^2*f)*ArcTanh[(Sqrt[b]*Sqrt[c + d*x])/Sqrt[b*c - a*d]])/(4*a^3*b^(3/2)*(b*c - a*d)^(3/2))

Rubi [A] time = 0.273771, antiderivative size = 208, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 5, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.2$, Rules used = {149, 151, 156, 63, 208}

$$\frac{(3a^2bd^2e + a^3d^2f - 12ab^2cde + 8b^3c^2e) \tanh^{-1}\left(\frac{\sqrt{b}\sqrt{c+dx}}{\sqrt{bc-ad}}\right)}{4a^3b^{3/2}(bc-ad)^{3/2}} + \frac{\sqrt{c+dx}(a^2(-d)f - 3abde + 4b^2ce)}{4a^2b(a+bx)(bc-ad)} - \frac{2\sqrt{ce} \tanh^{-1}\left(\frac{\sqrt{c+dx}}{\sqrt{c}}\right)}{a^3}$$

Antiderivative was successfully verified.

[In] Int[(Sqrt[c + d*x]*(e + f*x))/(x*(a + b*x)^3), x]

[Out] ((b*e - a*f)*Sqrt[c + d*x])/(2*a*b*(a + b*x)^2) + ((4*b^2*c*e - 3*a*b*d*e - a^2*d*f)*Sqrt[c + d*x])/(4*a^2*b*(b*c - a*d)*(a + b*x)) - (2*Sqrt[c]*e*ArcTanh[Sqrt[c + d*x]/Sqrt[c]])/a^3 + ((8*b^3*c^2*e - 12*a*b^2*c*d*e + 3*a^2*b*d^2*e + a^3*d^2*f)*ArcTanh[(Sqrt[b]*Sqrt[c + d*x])/Sqrt[b*c - a*d]])/(4*a^3*b^(3/2)*(b*c - a*d)^(3/2))

Rule 149

Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_)*((e_.) + (f_.)*(x_))^(p_)*((g_.) + (h_.)*(x_)), x_Symbol] := Simp[((b*g - a*h)*(a + b*x)^(m + 1)*(c + d*x)^n*(e + f*x)^(p + 1))/(b*(b*e - a*f)*(m + 1)), x] - Dist[1/(b*(b*e - a*f)*(m + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^(n - 1)*(e + f*x)^p*Simp[b*c*(f*g - e*h)*(m + 1) + (b*g - a*h)*(d*e*n + c*f*(p + 1)) + d*(b*(f*g - e*h)*(m + 1) + f*(b*g - a*h)*(n + p + 1))*x, x], x] /; FreeQ[{a, b, c, d, e, f, g, h, p}, x] && LtQ[m, -1] && GtQ[n, 0] && IntegerQ[m]

Rule 151

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_)*((e_.) + (f_.)*(x_))^(p_)*((g_.) + (h_.)*(x_)), x_Symbol] := Simp[((b*g - a*h)*(a + b*x)^(m + 1)*(c + d*x)^(n + 1)*(e + f*x)^(p + 1))/((m + 1)*(b*c - a*d)*(b*e - a*f)), x] + Dist[1/((m + 1)*(b*c - a*d)*(b*e - a*f)), Int[(a + b*x)^(m + 1)*(c + d*x)^n*(e + f*x)^p*Simp[(a*d*f*g - b*(d*e + c*f)*g + b*c*e*h)*(m + 1) - (b*g - a*h)*(d*e*(n + 1) + c*f*(p + 1)) - d*f*(b*g - a*h)*(m + n + p + 3)*x, x], x], x] /; FreeQ[{a, b, c, d, e, f, g, h, n, p}, x] && LtQ[m, -1] && IntegerQ[m]
```

Rule 156

```
Int[(((e_.) + (f_.)*(x_))^(p_)*((g_.) + (h_.)*(x_)))/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] := Dist[(b*g - a*h)/(b*c - a*d), Int[(e + f*x)^p/(a + b*x), x], x] - Dist[(d*g - c*h)/(b*c - a*d), Int[(e + f*x)^p/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] := With[{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b + (d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Denominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] := Simp[(Rt[-(a/b), 2]*ArcTanh[x/Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rubi steps

$$\begin{aligned}
\int \frac{\sqrt{c+dx}(e+fx)}{x(a+bx)^3} dx &= \frac{(be-af)\sqrt{c+dx}}{2ab(a+bx)^2} - \frac{\int \frac{-2bce-\frac{1}{2}d(3be+af)x}{x(a+bx)^2\sqrt{c+dx}} dx}{2ab} \\
&= \frac{(be-af)\sqrt{c+dx}}{2ab(a+bx)^2} + \frac{(4b^2ce-3abde-a^2df)\sqrt{c+dx}}{4a^2b(bc-ad)(a+bx)} - \frac{\int \frac{-2bc(bc-ad)e-\frac{1}{4}d(4b^2ce-ad(3be+af))x}{x(a+bx)\sqrt{c+dx}} dx}{2a^2b(bc-ad)} \\
&= \frac{(be-af)\sqrt{c+dx}}{2ab(a+bx)^2} + \frac{(4b^2ce-3abde-a^2df)\sqrt{c+dx}}{4a^2b(bc-ad)(a+bx)} + \frac{(ce)\int \frac{1}{x\sqrt{c+dx}} dx}{a^3} - \frac{(8b^3c^2e-12ab^2cde+8a^2bd^2e+a^3d^2f-12ab^2cde+8b^3c^2e)}{a^3} \\
&= \frac{(be-af)\sqrt{c+dx}}{2ab(a+bx)^2} + \frac{(4b^2ce-3abde-a^2df)\sqrt{c+dx}}{4a^2b(bc-ad)(a+bx)} + \frac{(2ce)\text{Subst}\left(\int \frac{1}{-\frac{c}{a}+\frac{x^2}{a}} dx, x, \sqrt{c+dx}\right)}{a^3d} \\
&= \frac{(be-af)\sqrt{c+dx}}{2ab(a+bx)^2} + \frac{(4b^2ce-3abde-a^2df)\sqrt{c+dx}}{4a^2b(bc-ad)(a+bx)} - \frac{2\sqrt{ce}\tanh^{-1}\left(\frac{\sqrt{c+dx}}{\sqrt{c}}\right)}{a^3} + \frac{(8b^3c^2e-12ab^2cde+8a^2bd^2e+a^3d^2f-12ab^2cde+8b^3c^2e)}{a^3}
\end{aligned}$$

Mathematica [A] time = 0.635833, size = 260, normalized size = 1.25

$$\frac{(3a^2bd^2e+a^3d^2f-12ab^2cde+8b^3c^2e)\left(\sqrt{b}\sqrt{c+dx}-\sqrt{bc-ad}\tanh^{-1}\left(\frac{\sqrt{b}\sqrt{c+dx}}{\sqrt{bc-ad}}\right)\right)}{2a^2b^{3/2}(ad-bc)} - \frac{(c+dx)^{3/2}(a^2df-5abde+4b^2ce)}{2a(a+bx)(ad-bc)} + \frac{4e(bc-ad)\left(\sqrt{c+dx}-\sqrt{c}\tanh^{-1}\left(\frac{\sqrt{c+dx}}{\sqrt{c}}\right)\right)}{a^2} + \frac{(8b^3c^2e-12ab^2cde+8a^2bd^2e+a^3d^2f-12ab^2cde+8b^3c^2e)}{a^3}$$

Antiderivative was successfully verified.

[In] Integrate[(Sqrt[c + d*x]*(e + f*x))/(x*(a + b*x)^3), x]

[Out] (((b*e - a*f)*(c + d*x)^(3/2))/(a + b*x)^2 - ((4*b^2*c*e - 5*a*b*d*e + a^2*d*f)*(c + d*x)^(3/2))/(2*a*(-(b*c) + a*d)*(a + b*x)) + (4*(b*c - a*d)*e*(Sqrt[c + d*x] - Sqrt[c]*ArcTanh[Sqrt[c + d*x]/Sqrt[c]]))/a^2 + ((8*b^3*c^2*e - 12*a*b^2*c*d*e + 3*a^2*b*d^2*e + a^3*d^2*f)*(Sqrt[b]*Sqrt[c + d*x] - Sqrt[b*c - a*d]*ArcTanh[(Sqrt[b]*Sqrt[c + d*x])/Sqrt[b*c - a*d]]))/(2*a^2*b^(3/2)*(-(b*c) + a*d)))/(2*a*(b*c - a*d))

Maple [B] time = 0.016, size = 424, normalized size = 2.

$$-2\frac{e\sqrt{c}}{a^3}\text{Arctanh}\left(\frac{\sqrt{dx+c}}{\sqrt{c}}\right) + \frac{d^2f}{4(bdx+ad)^2(ad-bc)}(dx+c)^{\frac{3}{2}} + \frac{3d^2be}{4a(bdx+ad)^2(ad-bc)}(dx+c)^{\frac{3}{2}} - \frac{b^2cde}{a^2(bdx+ad)^2(ad-bc)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] $\text{int}((f*x+e)*(d*x+c)^{(1/2)}/x/(b*x+a)^3,x)$

[Out] $-2*e*\text{arctanh}((d*x+c)^{(1/2)}/c^{(1/2)})*c^{(1/2)}/a^3+1/4*d^2/(b*d*x+a*d)^2/(a*d-b*c)*(d*x+c)^{(3/2)}*f+3/4*d^2/a/(b*d*x+a*d)^2/(a*d-b*c)*(d*x+c)^{(3/2)}*b*e-d/a^2/(b*d*x+a*d)^2/(a*d-b*c)*(d*x+c)^{(3/2)}*b^2*c*e-1/4*d^2/(b*d*x+a*d)^2/b*(d*x+c)^{(1/2)}*f+5/4*d^2/a/(b*d*x+a*d)^2*(d*x+c)^{(1/2)}*e-d/a^2/(b*d*x+a*d)^2*b*(d*x+c)^{(1/2)}*c*e+1/4*d^2/(a*d-b*c)/b/((a*d-b*c)*b)^{(1/2)}*\text{arctan}(b*(d*x+c)^{(1/2)}/((a*d-b*c)*b)^{(1/2)})*f+3/4*d^2/a/(a*d-b*c)/((a*d-b*c)*b)^{(1/2)}*\text{arctan}(b*(d*x+c)^{(1/2)}/((a*d-b*c)*b)^{(1/2)})*e-3*d/a^2/(a*d-b*c)*b/((a*d-b*c)*b)^{(1/2)}*\text{arctan}(b*(d*x+c)^{(1/2)}/((a*d-b*c)*b)^{(1/2)})*c*e+2/a^3/(a*d-b*c)*b^2/((a*d-b*c)*b)^{(1/2)}*\text{arctan}(b*(d*x+c)^{(1/2)}/((a*d-b*c)*b)^{(1/2)})*c^2*e$

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

[In] $\text{integrate}((f*x+e)*(d*x+c)^{(1/2)}/x/(b*x+a)^3,x, \text{algorithm}="maxima")$

[Out] Exception raised: ValueError

Fricas [B] time = 4.49477, size = 4552, normalized size = 21.88

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] $\text{integrate}((f*x+e)*(d*x+c)^{(1/2)}/x/(b*x+a)^3,x, \text{algorithm}="fricas")$

[Out] $[-1/8*((a^5*d^2*f + (a^3*b^2*d^2*f + (8*b^5*c^2 - 12*a*b^4*c*d + 3*a^2*b^3*d^2)*e)*x^2 + (8*a^2*b^3*c^2 - 12*a^3*b^2*c*d + 3*a^4*b*d^2)*e + 2*(a^4*b*d^2*f + (8*a*b^4*c^2 - 12*a^2*b^3*c*d + 3*a^3*b^2*d^2)*e)*x)*\text{sqrt}(b^2*c - a*b*d)*\log((b*d*x + 2*b*c - a*d - 2*\text{sqrt}(b^2*c - a*b*d)*\text{sqrt}(d*x + c))/(b*x + a)) - 8*((b^6*c^2 - 2*a*b^5*c*d + a^2*b^4*d^2)*e*x^2 + 2*(a*b^5*c^2 - 2*a^2*b^4*c*d + a^3*b^3*d^2)*e*x + (a^2*b^4*c^2 - 2*a^3*b^3*c*d + a^4*b^2*d^2)*e)*\text{sqrt}(c)*\log((d*x - 2*\text{sqrt}(d*x + c)*\text{sqrt}(c) + 2*c)/x) - 2*((6*a^2*b^4*c^2 - 11*a^3*b^3*c*d + 5*a^4*b^2*d^2)*e - (2*a^3*b^3*c^2 - 3*a^4*b^2*c*d + a^5*b*d^2)*f + ((4*a*b^5*c^2 - 7*a^2*b^4*c*d + 3*a^3*b^3*d^2)*e - (a^3*b^3*c*d$

$$\begin{aligned}
& - a^4 b^2 d^2) f) x) \sqrt{d x + c}) / (a^5 b^4 c^2 - 2 a^6 b^3 c d + a^7 b^2 \\
& * d^2 + (a^3 b^6 c^2 - 2 a^4 b^5 c d + a^5 b^4 d^2) x^2 + 2 (a^4 b^5 c^2 - 2 \\
& * a^5 b^4 c d + a^6 b^3 d^2) x), -1/4 * ((a^5 d^2 f + (a^3 b^2 d^2 f + (8 b^5 * \\
& c^2 - 12 a b^4 c d + 3 a^2 b^3 d^2) e) x^2 + (8 a^2 b^3 c^2 - 12 a^3 b^2 c * \\
& d + 3 a^4 b d^2) e + 2 (a^4 b d^2 f + (8 a b^4 c^2 - 12 a^2 b^3 c d + 3 a^3 \\
& b^2 d^2) e) x) \sqrt{-b^2 c + a b d} \arctan(\sqrt{-b^2 c + a b d} \sqrt{d x + \\
& c}) / (b d x + b c)) - 4 * ((b^6 c^2 - 2 a b^5 c d + a^2 b^4 d^2) e x^2 + 2 (a \\
& b^5 c^2 - 2 a^2 b^4 c d + a^3 b^3 d^2) e x + (a^2 b^4 c^2 - 2 a^3 b^3 c d + \\
& a^4 b^2 d^2) e) \sqrt{c} \log((d x - 2 \sqrt{d x + c}) \sqrt{c} + 2 c) / x - ((6 \\
& * a^2 b^4 c^2 - 11 a^3 b^3 c d + 5 a^4 b^2 d^2) e - (2 a^3 b^3 c^2 - 3 a^4 b \\
& ^2 c d + a^5 b d^2) f + ((4 a b^5 c^2 - 7 a^2 b^4 c d + 3 a^3 b^3 d^2) e - \\
& (a^3 b^3 c d - a^4 b^2 d^2) f) x) \sqrt{d x + c}) / (a^5 b^4 c^2 - 2 a^6 b^3 c \\
& * d + a^7 b^2 d^2 + (a^3 b^6 c^2 - 2 a^4 b^5 c d + a^5 b^4 d^2) x^2 + 2 (a^4 \\
& b^5 c^2 - 2 a^5 b^4 c d + a^6 b^3 d^2) x), 1/8 * (16 * ((b^6 c^2 - 2 a b^5 c d \\
& + a^2 b^4 d^2) e x^2 + 2 (a b^5 c^2 - 2 a^2 b^4 c d + a^3 b^3 d^2) e x + (\\
& a^2 b^4 c^2 - 2 a^3 b^3 c d + a^4 b^2 d^2) e) \sqrt{-c} \arctan(\sqrt{d x + c} \\
& * \sqrt{-c}) / c - (a^5 d^2 f + (a^3 b^2 d^2 f + (8 b^5 c^2 - 12 a b^4 c d + 3 \\
& a^2 b^3 d^2) e) x^2 + (8 a^2 b^3 c^2 - 12 a^3 b^2 c d + 3 a^4 b d^2) e + 2 * \\
& (a^4 b d^2 f + (8 a b^4 c^2 - 12 a^2 b^3 c d + 3 a^3 b^2 d^2) e) x) \sqrt{b^2 \\
& c - a b d} \log((b d x + 2 b c - a d - 2 \sqrt{b^2 c - a b d}) \sqrt{d x + c} \\
&) / (b x + a)) + 2 * ((6 a^2 b^4 c^2 - 11 a^3 b^3 c d + 5 a^4 b^2 d^2) e - (2 a \\
& ^3 b^3 c^2 - 3 a^4 b^2 c d + a^5 b d^2) f + ((4 a b^5 c^2 - 7 a^2 b^4 c d + \\
& 3 a^3 b^3 d^2) e - (a^3 b^3 c d - a^4 b^2 d^2) f) x) \sqrt{d x + c}) / (a^5 b \\
& ^4 c^2 - 2 a^6 b^3 c d + a^7 b^2 d^2 + (a^3 b^6 c^2 - 2 a^4 b^5 c d + a^5 b \\
& ^4 d^2) x^2 + 2 (a^4 b^5 c^2 - 2 a^5 b^4 c d + a^6 b^3 d^2) x), -1/4 * ((a^5 \\
& d^2 f + (a^3 b^2 d^2 f + (8 b^5 c^2 - 12 a b^4 c d + 3 a^2 b^3 d^2) e) x^2 \\
& + (8 a^2 b^3 c^2 - 12 a^3 b^2 c d + 3 a^4 b d^2) e + 2 (a^4 b d^2 f + (8 a \\
& b^4 c^2 - 12 a^2 b^3 c d + 3 a^3 b^2 d^2) e) x) \sqrt{-b^2 c + a b d} \arctan \\
& (\sqrt{-b^2 c + a b d} \sqrt{d x + c}) / (b d x + b c)) - 8 * ((b^6 c^2 - 2 a b^5 \\
& c d + a^2 b^4 d^2) e x^2 + 2 (a b^5 c^2 - 2 a^2 b^4 c d + a^3 b^3 d^2) e x \\
& + (a^2 b^4 c^2 - 2 a^3 b^3 c d + a^4 b^2 d^2) e) \sqrt{-c} \arctan(\sqrt{d x + \\
& c}) \sqrt{-c}) / c - ((6 a^2 b^4 c^2 - 11 a^3 b^3 c d + 5 a^4 b^2 d^2) e - (2 \\
& a^3 b^3 c^2 - 3 a^4 b^2 c d + a^5 b d^2) f + ((4 a b^5 c^2 - 7 a^2 b^4 c d \\
& + 3 a^3 b^3 d^2) e - (a^3 b^3 c d - a^4 b^2 d^2) f) x) \sqrt{d x + c}) / (a^5 \\
& b^4 c^2 - 2 a^6 b^3 c d + a^7 b^2 d^2 + (a^3 b^6 c^2 - 2 a^4 b^5 c d + a^5 \\
& b^4 d^2) x^2 + 2 (a^4 b^5 c^2 - 2 a^5 b^4 c d + a^6 b^3 d^2) x)]
\end{aligned}$$

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((f*x+e)*(d*x+c)**(1/2)/x/(b*x+a)**3,x)

[Out] Timed out

Giac [A] time = 1.74538, size = 405, normalized size = 1.95

$$\frac{(a^3 d^2 f + 8 b^3 c^2 e - 12 a b^2 c d e + 3 a^2 b d^2 e) \arctan\left(\frac{\sqrt{d x + c}}{\sqrt{-b^2 c + a b d}}\right) + 2 c \arctan\left(\frac{\sqrt{d x + c}}{\sqrt{-c}}\right) e - \frac{(d x + c)^{\frac{3}{2}} a^2 b d^2 f + \sqrt{d x + c} a^2 b d^2 e}{4 (a^3 b^2 c - a^4 b d) \sqrt{-b^2 c + a b d}}}{a^3 \sqrt{-c}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((f*x+e)*(d*x+c)^(1/2)/x/(b*x+a)^3,x, algorithm="giac")

[Out]
$$\frac{-1/4*(a^3*d^2*f + 8*b^3*c^2*e - 12*a*b^2*c*d*e + 3*a^2*b*d^2*e)*\arctan(\sqrt{(d*x + c)*b/\sqrt{-b^2*c + a*b*d}})/((a^3*b^2*c - a^4*b*d)*\sqrt{-b^2*c + a*b*d}) + 2*c*\arctan(\sqrt{(d*x + c)/\sqrt{-c}})*e/(a^3*\sqrt{-c}) - 1/4*((d*x + c)^{(3/2)}*a^2*b*d^2*f + \sqrt{(d*x + c)}*a^2*b*c*d^2*f - \sqrt{(d*x + c)}*a^3*d^3*f - 4*(d*x + c)^{(3/2)}*b^3*c*d*e + 4*\sqrt{(d*x + c)}*b^3*c^2*d*e + 3*(d*x + c)^{(3/2)}*a*b^2*d^2*e - 9*\sqrt{(d*x + c)}*a*b^2*c*d^2*e + 5*\sqrt{(d*x + c)}*a^2*b*d^3*e)/((a^2*b^2*c - a^3*b*d)*((d*x + c)*b - b*c + a*d)^2)}$$

$$3.15 \quad \int \frac{\sqrt{a+bx}(c+dx)^3(e+fx)}{x} dx$$

Optimal. Leaf size=226

$$\frac{2(a+bx)^{3/2} \left(2(-12a^2bd^2(3cf+de) + 8a^3d^3f + 3ab^2cd(16cf+21de) - 5b^3c^2(4cf+27de)) - 3bdx(4(bc-ad)(-2adf + \dots) \right)}{315b^4}$$

[Out] 2*c^3*e*Sqrt[a + b*x] + (2*(3*b*d*e + 2*b*c*f - 2*a*d*f)*(a + b*x)^(3/2)*(c + d*x)^2)/(21*b^2) + (2*f*(a + b*x)^(3/2)*(c + d*x)^3)/(9*b) - (2*(a + b*x)^(3/2)*(2*(8*a^3*d^3*f - 12*a^2*b*d^2*(d*e + 3*c*f) - 5*b^3*c^2*(27*d*e + 4*c*f) + 3*a*b^2*c*d*(21*d*e + 16*c*f)) - 3*b*d*(21*b^2*c*d*e + 4*(b*c - a*d)*(3*b*d*e + 2*b*c*f - 2*a*d*f))*x)/(315*b^4) - 2*Sqrt[a]*c^3*e*ArcTanh[Sqrt[a + b*x]/Sqrt[a]]

Rubi [A] time = 0.251778, antiderivative size = 226, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.2$, Rules used = {153, 147, 50, 63, 208}

$$\frac{2(a+bx)^{3/2} \left(2(-12a^2bd^2(3cf+de) + 8a^3d^3f + 3ab^2cd(16cf+21de) - 5b^3c^2(4cf+27de)) - 3bdx(4(bc-ad)(-2adf + \dots) \right)}{315b^4}$$

Antiderivative was successfully verified.

[In] Int[(Sqrt[a + b*x]*(c + d*x)^3*(e + f*x))/x,x]

[Out] 2*c^3*e*Sqrt[a + b*x] + (2*(3*b*d*e + 2*b*c*f - 2*a*d*f)*(a + b*x)^(3/2)*(c + d*x)^2)/(21*b^2) + (2*f*(a + b*x)^(3/2)*(c + d*x)^3)/(9*b) - (2*(a + b*x)^(3/2)*(2*(8*a^3*d^3*f - 12*a^2*b*d^2*(d*e + 3*c*f) - 5*b^3*c^2*(27*d*e + 4*c*f) + 3*a*b^2*c*d*(21*d*e + 16*c*f)) - 3*b*d*(21*b^2*c*d*e + 4*(b*c - a*d)*(3*b*d*e + 2*b*c*f - 2*a*d*f))*x)/(315*b^4) - 2*Sqrt[a]*c^3*e*ArcTanh[Sqrt[a + b*x]/Sqrt[a]]

Rule 153

Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_)*((e_.) + (f_.)*(x_))^(p_)*((g_.) + (h_.)*(x_)), x_Symbol] := Simp[(h*(a + b*x)^m*(c + d*x)^(n+1)*(e + f*x)^(p+1))/(d*f*(m + n + p + 2)), x] + Dist[1/(d*f*(m + n + p + 2)), Int[(a + b*x)^(m-1)*(c + d*x)^n*(e + f*x)^p*Simp[a*d*f*g*(m + n + p + 2) - h*(b*c*e*m + a*(d*e*(n+1) + c*f*(p+1))) + (b*d*f*g*(m + n + p + 2) + h*(a*d*f*m - b*(d*e*(m + n + 1) + c*f*(m + p + 1)))]*x, x], x] /

; FreeQ[{a, b, c, d, e, f, g, h, n, p}, x] && GtQ[m, 0] && NeQ[m + n + p + 2, 0] && IntegerQ[m]

Rule 147

Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))*((g_.) + (h_.)*(x_)), x_Symbol] := -Simp[((a*d*f*h*(n + 2) + b*c*f*h*(m + 2) - b*d*(f*g + e*h)*(m + n + 3) - b*d*f*h*(m + n + 2)*x)*(a + b*x)^(m + 1)*(c + d*x)^(n + 1))/(b^2*d^2*(m + n + 2)*(m + n + 3)), x] + Dist[(a^2*d^2*f*h*(n + 1)*(n + 2) + a*b*d*(n + 1)*(2*c*f*h*(m + 1) - d*(f*g + e*h)*(m + n + 3)) + b^2*(c^2*f*h*(m + 1)*(m + 2) - c*d*(f*g + e*h)*(m + 1)*(m + n + 3) + d^2*e*g*(m + n + 2)*(m + n + 3)))/(b^2*d^2*(m + n + 2)*(m + n + 3)), Int[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n}, x] && NeQ[m + n + 2, 0] && NeQ[m + n + 3, 0]

Rule 50

Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := Simp[((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + n + 1)), x] + Dist[(n*(b*c - a*d))/(b*(m + n + 1)), Int[(a + b*x)^m*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0] && GtQ[n, 0] && NeQ[m + n + 1, 0] && !(IGtQ[m, 0] && (!IntegerQ[n] || (GtQ[m, 0] && LtQ[m - n, 0]))) && !ILtQ[m + n + 2, 0] && IntLinearQ[a, b, c, d, m, n, x]

Rule 63

Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := With[{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b + (d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Denominator[m]] && IntLinearQ[a, b, c, d, m, n, x]

Rule 208

Int[((a_.) + (b_.)*(x_)^2)^(-1), x_Symbol] := Simp[(Rt[-(a/b), 2]*ArcTanh[x/Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]

Rubi steps

$$\begin{aligned}
\int \frac{\sqrt{a+bx}(c+dx)^3(e+fx)}{x} dx &= \frac{2f(a+bx)^{3/2}(c+dx)^3}{9b} + \frac{2 \int \frac{\sqrt{a+bx}(c+dx)^2 \left(\frac{9bce}{2} + \frac{3}{2}(3bde+2bcf-2adf)x \right)}{x} dx}{9b} \\
&= \frac{2(3bde+2bcf-2adf)(a+bx)^{3/2}(c+dx)^2}{21b^2} + \frac{2f(a+bx)^{3/2}(c+dx)^3}{9b} + \frac{4 \int \frac{\sqrt{a+bx}(c+dx)}{x} dx}{21b^2} \\
&= \frac{2(3bde+2bcf-2adf)(a+bx)^{3/2}(c+dx)^2}{21b^2} + \frac{2f(a+bx)^{3/2}(c+dx)^3}{9b} - \frac{2(a+bx)^{3/2}}{9b} \left(2\sqrt{a+bx} - \frac{2a}{\sqrt{a+bx}} \right) \\
&= 2c^3e\sqrt{a+bx} + \frac{2(3bde+2bcf-2adf)(a+bx)^{3/2}(c+dx)^2}{21b^2} + \frac{2f(a+bx)^{3/2}(c+dx)^3}{9b} - \frac{2(a+bx)^{3/2}}{9b} \left(2\sqrt{a+bx} - \frac{2a}{\sqrt{a+bx}} \right) \\
&= 2c^3e\sqrt{a+bx} + \frac{2(3bde+2bcf-2adf)(a+bx)^{3/2}(c+dx)^2}{21b^2} + \frac{2f(a+bx)^{3/2}(c+dx)^3}{9b} - \frac{2(a+bx)^{3/2}}{9b} \left(2\sqrt{a+bx} - \frac{2a}{\sqrt{a+bx}} \right) \\
&= 2c^3e\sqrt{a+bx} + \frac{2(3bde+2bcf-2adf)(a+bx)^{3/2}(c+dx)^2}{21b^2} + \frac{2f(a+bx)^{3/2}(c+dx)^3}{9b} - \frac{2(a+bx)^{3/2}}{9b} \left(2\sqrt{a+bx} - \frac{2a}{\sqrt{a+bx}} \right)
\end{aligned}$$

Mathematica [A] time = 0.273006, size = 204, normalized size = 0.9

$$\frac{2 \left(3be \left(35d(a+bx)^{3/2} (a^2d^2 - 3abcd + 3b^2c^2) + 105b^3c^3\sqrt{a+bx} - 105\sqrt{ab^3}c^3 \tanh^{-1} \left(\frac{\sqrt{a+bx}}{\sqrt{a}} \right) + 21d^2(a+bx)^{5/2}(3bc - 2ad) \right) \right)}{315b^4}$$

Antiderivative was successfully verified.

[In] Integrate[(Sqrt[a + b*x]*(c + d*x)^3*(e + f*x))/x,x]

[Out] (2*(f*(a + b*x)^(3/2)*(105*(b*c - a*d)^3 + 189*d*(b*c - a*d)^2*(a + b*x) + 135*d^2*(b*c - a*d)*(a + b*x)^2 + 35*d^3*(a + b*x)^3) + 3*b*e*(105*b^3*c^3*Sqrt[a + b*x] + 35*d*(3*b^2*c^2 - 3*a*b*c*d + a^2*d^2)*(a + b*x)^(3/2) + 21*d^2*(3*b*c - 2*a*d)*(a + b*x)^(5/2) + 15*d^3*(a + b*x)^(7/2) - 105*Sqrt[a]*b^3*c^3*ArcTanh[Sqrt[a + b*x]/Sqrt[a]]))/(315*b^4)

Maple [A] time = 0.008, size = 301, normalized size = 1.3

$$2 \frac{1}{b^4} \left(\frac{1}{9} f d^3 (bx+a)^{9/2} - \frac{3}{7} (bx+a)^{7/2} a d^3 f + \frac{3}{7} (bx+a)^{7/2} b c d^2 f + \frac{1}{7} (bx+a)^{7/2} b d^3 e + \frac{3}{5} (bx+a)^{5/2} a^2 d^3 f - \frac{6}{5} (bx+a)^{3/2} a^3 d^3 f \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] $\text{int}((d*x+c)^3*(f*x+e)*(b*x+a)^{(1/2)}/x,x)$

[Out] $2/b^4*(1/9*f*d^3*(b*x+a)^{(9/2)}-3/7*(b*x+a)^{(7/2)}*a*d^3*f+3/7*(b*x+a)^{(7/2)}*b*c*d^2*f+1/7*(b*x+a)^{(7/2)}*b*d^3*e+3/5*(b*x+a)^{(5/2)}*a^2*d^3*f-6/5*(b*x+a)^{(5/2)}*a*b*c*d^2*f-2/5*(b*x+a)^{(5/2)}*a*b*d^3*e+3/5*(b*x+a)^{(5/2)}*b^2*c^2*d*f+3/5*(b*x+a)^{(5/2)}*b^2*c*d^2*e-1/3*(b*x+a)^{(3/2)}*a^3*d^3*f+(b*x+a)^{(3/2)}*a^2*b*c*d^2*f+1/3*(b*x+a)^{(3/2)}*a^2*b*d^3*e-(b*x+a)^{(3/2)}*a*b^2*c^2*d*f-(b*x+a)^{(3/2)}*a*b^2*c*d^2*e+1/3*(b*x+a)^{(3/2)}*b^3*c^3*f+(b*x+a)^{(3/2)}*b^3*c^2*d*e+b^4*c^3*e*(b*x+a)^{(1/2)}-a^{(1/2)}*b^4*c^3*e*\text{arctanh}((b*x+a)^{(1/2)}/a^{(1/2)})$

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

[In] $\text{integrate}((d*x+c)^3*(f*x+e)*(b*x+a)^{(1/2)}/x,x, \text{algorithm}="maxima")$

[Out] Exception raised: ValueError

Fricas [A] time = 1.42747, size = 1419, normalized size = 6.28

$$\left[\frac{315 \sqrt{a} b^4 c^3 e \log\left(\frac{bx-2\sqrt{bx+a}\sqrt{a+2a}}{x}\right) + 2(35 b^4 d^3 f x^4 + 5(9 b^4 d^3 e + (27 b^4 c d^2 + a b^3 d^3) f) x^3 + 3(3(21 b^4 c d^2 + a b^3 d^3) e + \right.}{\left. \right)}{}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] $\text{integrate}((d*x+c)^3*(f*x+e)*(b*x+a)^{(1/2)}/x,x, \text{algorithm}="fricas")$

[Out] $[1/315*(315*\text{sqrt}(a)*b^4*c^3*e*\log((b*x - 2*\text{sqrt}(b*x + a))*\text{sqrt}(a) + 2*a)/x) + 2*(35*b^4*d^3*f*x^4 + 5*(9*b^4*d^3*e + (27*b^4*c*d^2 + a*b^3*d^3)*f)*x^3 + 3*(3*(21*b^4*c*d^2 + a*b^3*d^3)*e + (63*b^4*c^2*d + 9*a*b^3*c*d^2 - 2*a^2*b^2*d^3)*f)*x^2 + 3*(105*b^4*c^3 + 105*a*b^3*c^2*d - 42*a^2*b^2*c*d^2 + 8*a^3*b*d^3)*e + (105*a*b^3*c^3 - 126*a^2*b^2*c^2*d + 72*a^3*b*c*d^2 - 16*a^4*d^3)*f + (3*(105*b^4*c^2*d + 21*a*b^3*c*d^2 - 4*a^2*b^2*d^3)*e + (105*b^4*c^3 + 63*a*b^3*c^2*d - 36*a^2*b^2*c*d^2 + 8*a^3*b*d^3)*f)*x]*\text{sqrt}(b*x + a) / b^4, 2/315*(315*\text{sqrt}(-a)*b^4*c^3*e*\text{arctan}(\text{sqrt}(b*x + a)*\text{sqrt}(-a)/a) + (35*$

$$b^4 d^3 f x^4 + 5(9b^4 d^3 e + (27b^4 c d^2 + a b^3 d^3) f) x^3 + 3(3(21b^4 c d^2 + a b^3 d^3) e + (63b^4 c^2 d + 9a b^3 c d^2 - 2a^2 b^2 d^3) f) x^2 + 3(105b^4 c^3 + 105a b^3 c^2 d - 42a^2 b^2 c d^2 + 8a^3 b d^3) e + (105a b^3 c^3 - 126a^2 b^2 c^2 d + 72a^3 b c d^2 - 16a^4 d^3) f + (3(105b^4 c^2 d + 21a b^3 c d^2 - 4a^2 b^2 d^3) e + (105b^4 c^3 + 63a b^3 c^2 d - 36a^2 b^2 c d^2 + 8a^3 b d^3) f) x) \sqrt{bx + a} / b^4]$$

Sympy [A] time = 26.1571, size = 274, normalized size = 1.21

$$\frac{2ac^3 e \operatorname{atan}\left(\frac{\sqrt{a+bx}}{\sqrt{-a}}\right)}{\sqrt{-a}} + 2c^3 e \sqrt{a+bx} + \frac{2d^3 f (a+bx)^{9/2}}{9b^4} + \frac{2(a+bx)^{7/2} (-3ad^3 f + 3bcd^2 f + bd^3 e)}{7b^4} + \frac{2(a+bx)^{5/2} (3a^2 d^3 f - 6a^2 b c d^2 f + 3a^3 b d^3 e)}{7b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d*x+c)**3*(f*x+e)*(b*x+a)**(1/2)/x,x)

[Out] 2*a*c**3*e*atan(sqrt(a + b*x)/sqrt(-a))/sqrt(-a) + 2*c**3*e*sqrt(a + b*x) + 2*d**3*f*(a + b*x)**(9/2)/(9*b**4) + 2*(a + b*x)**(7/2)*(-3*a*d**3*f + 3*b*c*d**2*f + b*d**3*e)/(7*b**4) + 2*(a + b*x)**(5/2)*(3*a**2*d**3*f - 6*a*b*c*d**2*f - 2*a*b*d**3*e + 3*b**2*c**2*d*f + 3*b**2*c*d**2*e)/(5*b**4) + 2*(a + b*x)**(3/2)*(-a**3*d**3*f + 3*a**2*b*c*d**2*f + a**2*b*d**3*e - 3*a*b**2*c**2*d*f - 3*a*b**2*c*d**2*e + b**3*c**3*f + 3*b**3*c**2*d*e)/(3*b**4)

Giac [A] time = 2.56003, size = 456, normalized size = 2.02

$$\frac{2ac^3 \arctan\left(\frac{\sqrt{bx+a}}{\sqrt{-a}}\right) e}{\sqrt{-a}} + \frac{2\left(105(bx+a)^{3/2} b^{35} c^3 f + 189(bx+a)^{5/2} b^{34} c^2 d f - 315(bx+a)^{3/2} a b^{34} c^2 d f + 135(bx+a)^{7/2} b^{33} c d^2 f\right)}{7b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d*x+c)^3*(f*x+e)*(b*x+a)^(1/2)/x,x, algorithm="giac")

[Out] 2*a*c^3*arctan(sqrt(b*x + a)/sqrt(-a))*e/sqrt(-a) + 2/315*(105*(b*x + a)^(3/2)*b^35*c^3*f + 189*(b*x + a)^(5/2)*b^34*c^2*d*f - 315*(b*x + a)^(3/2)*a*b^34*c^2*d*f + 135*(b*x + a)^(7/2)*b^33*c*d^2*f - 378*(b*x + a)^(5/2)*a*b^33*c*d^2*f + 315*(b*x + a)^(3/2)*a^2*b^33*c*d^2*f + 35*(b*x + a)^(9/2)*b^32*d^3*f - 135*(b*x + a)^(7/2)*a*b^32*d^3*f + 189*(b*x + a)^(5/2)*a^2*b^32*d^3*f - 105*(b*x + a)^(3/2)*a^3*b^32*d^3*f + 315*sqrt(b*x + a)*b^36*c^3*e + 315

$$\begin{aligned} &*(b*x + a)^{(3/2)}*b^{35}*c^2*d*e + 189*(b*x + a)^{(5/2)}*b^{34}*c*d^2*e - 315*(b*x \\ &+ a)^{(3/2)}*a*b^{34}*c*d^2*e + 45*(b*x + a)^{(7/2)}*b^{33}*d^3*e - 126*(b*x + a)^{(5/2)}*a*b^{33}*d^3*e \\ &+ 105*(b*x + a)^{(3/2)}*a^2*b^{33}*d^3*e)/b^{36} \end{aligned}$$

$$3.16 \quad \int \frac{\sqrt{a+bx}(c+dx)^2(e+fx)}{x} dx$$

Optimal. Leaf size=145

$$\frac{2(a+bx)^{3/2} \left(2(4a^2d^2f - 7abd(2cf + de) + 5b^2c(2cf + 7de)) + 3bdx(-4adf + 4bcf + 7bde) \right)}{105b^3} + 2c^2e\sqrt{a+bx} - 2\sqrt{ac^2e} \operatorname{arctanh}\left(\frac{\sqrt{a+bx}}{\sqrt{a}}\right)$$

[Out] 2*c^2*e*Sqrt[a + b*x] + (2*f*(a + b*x)^(3/2)*(c + d*x)^2)/(7*b) + (2*(a + b*x)^(3/2)*(2*(4*a^2*d^2*f - 7*a*b*d*(d*e + 2*c*f) + 5*b^2*c*(7*d*e + 2*c*f) + 3*b*d*(7*b*d*e + 4*b*c*f - 4*a*d*f)*x))/(105*b^3) - 2*Sqrt[a]*c^2*e*ArcTanh[Sqrt[a + b*x]/Sqrt[a]]

Rubi [A] time = 0.0938083, antiderivative size = 145, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.2$, Rules used = {153, 147, 50, 63, 208}

$$\frac{2(a+bx)^{3/2} \left(2(4a^2d^2f - 7abd(2cf + de) + 5b^2c(2cf + 7de)) + 3bdx(-4adf + 4bcf + 7bde) \right)}{105b^3} + 2c^2e\sqrt{a+bx} - 2\sqrt{ac^2e} \operatorname{arctanh}\left(\frac{\sqrt{a+bx}}{\sqrt{a}}\right)$$

Antiderivative was successfully verified.

[In] Int[(Sqrt[a + b*x]*(c + d*x)^2*(e + f*x))/x,x]

[Out] 2*c^2*e*Sqrt[a + b*x] + (2*f*(a + b*x)^(3/2)*(c + d*x)^2)/(7*b) + (2*(a + b*x)^(3/2)*(2*(4*a^2*d^2*f - 7*a*b*d*(d*e + 2*c*f) + 5*b^2*c*(7*d*e + 2*c*f) + 3*b*d*(7*b*d*e + 4*b*c*f - 4*a*d*f)*x))/(105*b^3) - 2*Sqrt[a]*c^2*e*ArcTanh[Sqrt[a + b*x]/Sqrt[a]]

Rule 153

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_)*((e_.) + (f_.)*(x_))^(p_)*((g_.) + (h_.)*(x_)), x_Symbol] := Simp[(h*(a + b*x)^(m*(c + d*x)^(n + 1)*(e + f*x)^(p + 1))/(d*f*(m + n + p + 2)), x] + Dist[1/(d*f*(m + n + p + 2)), Int[(a + b*x)^(m - 1)*(c + d*x)^n*(e + f*x)^p*Simp[a*d*f*g*(m + n + p + 2) - h*(b*c*e*m + a*(d*e*(n + 1) + c*f*(p + 1))) + (b*d*f*g*(m + n + p + 2) + h*(a*d*f*m - b*(d*e*(m + n + 1) + c*f*(m + p + 1)))]*x, x], x] / ; FreeQ[{a, b, c, d, e, f, g, h, n, p}, x] && GtQ[m, 0] && NeQ[m + n + p + 2, 0] && IntegerQ[m]
```

Rule 147


```

Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_
))*((g_.) + (h_.)*(x_)), x_Symbol] := -Simp[((a*d*f*h*(n + 2) + b*c*f*h*(m
+ 2) - b*d*(f*g + e*h)*(m + n + 3) - b*d*f*h*(m + n + 2)*x)*(a + b*x)^(m +
1)*(c + d*x)^(n + 1))/(b^2*d^2*(m + n + 2)*(m + n + 3)), x] + Dist[(a^2*d^2
*f*h*(n + 1)*(n + 2) + a*b*d*(n + 1)*(2*c*f*h*(m + 1) - d*(f*g + e*h)*(m +
n + 3)) + b^2*(c^2*f*h*(m + 1)*(m + 2) - c*d*(f*g + e*h)*(m + 1)*(m + n + 3
) + d^2*e*g*(m + n + 2)*(m + n + 3)))/(b^2*d^2*(m + n + 2)*(m + n + 3)), In
t[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n},
x] && NeQ[m + n + 2, 0] && NeQ[m + n + 3, 0]

```

Rule 50

```

Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + n + 1)), x] + Dist[(n*(b*c - a*d))/
(b*(m + n + 1)), Int[(a + b*x)^m*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b,
c, d}, x] && NeQ[b*c - a*d, 0] && GtQ[n, 0] && NeQ[m + n + 1, 0] && !(IGtQ
[m, 0] && (!IntegerQ[n] || (GtQ[m, 0] && LtQ[m - n, 0]))) && !ILtQ[m + n
+ 2, 0] && IntLinearQ[a, b, c, d, m, n, x]

```

Rule 63

```

Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]

```

Rule 208

```

Int[((a_.) + (b_.)*(x_)^2)^(-1), x_Symbol] := Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]

```

Rubi steps

$$\begin{aligned}
\int \frac{\sqrt{a+bx}(c+dx)^2(e+fx)}{x} dx &= \frac{2f(a+bx)^{3/2}(c+dx)^2}{7b} + \frac{2 \int \frac{\sqrt{a+bx}(c+dx) \left(\frac{7bce}{2} + \frac{1}{2}(7bde+4bcf-4adf)x \right)}{x} dx}{7b} \\
&= \frac{2f(a+bx)^{3/2}(c+dx)^2}{7b} + \frac{2(a+bx)^{3/2} \left(2(4a^2d^2f - 7abd(de+2cf)) + 5b^2c(7de+2cf) \right)}{105b^3} \\
&= 2c^2e\sqrt{a+bx} + \frac{2f(a+bx)^{3/2}(c+dx)^2}{7b} + \frac{2(a+bx)^{3/2} \left(2(4a^2d^2f - 7abd(de+2cf)) + 5b^2c(7de+2cf) \right)}{105b^3} \\
&= 2c^2e\sqrt{a+bx} + \frac{2f(a+bx)^{3/2}(c+dx)^2}{7b} + \frac{2(a+bx)^{3/2} \left(2(4a^2d^2f - 7abd(de+2cf)) + 5b^2c(7de+2cf) \right)}{105b^3} \\
&= 2c^2e\sqrt{a+bx} + \frac{2f(a+bx)^{3/2}(c+dx)^2}{7b} + \frac{2(a+bx)^{3/2} \left(2(4a^2d^2f - 7abd(de+2cf)) + 5b^2c(7de+2cf) \right)}{105b^3}
\end{aligned}$$

Mathematica [A] time = 0.162919, size = 146, normalized size = 1.01

$$\frac{2 \left(7be \left(15b^2c^2\sqrt{a+bx} - 15\sqrt{ab^2c^2} \tanh^{-1} \left(\frac{\sqrt{a+bx}}{\sqrt{a}} \right) \right) + 5d(a+bx)^{3/2}(2bc-ad) + 3d^2(a+bx)^{5/2} \right) + f(a+bx)^{3/2} (42d(a+bx) + b^2c)}{105b^3}$$

Antiderivative was successfully verified.

[In] Integrate[(Sqrt[a + b*x]*(c + d*x)^2*(e + f*x))/x,x]

[Out] (2*(f*(a + b*x)^(3/2)*(35*(b*c - a*d)^2 + 42*d*(b*c - a*d)*(a + b*x) + 15*d^2*(a + b*x)^2) + 7*b*e*(15*b^2*c^2*Sqrt[a + b*x] + 5*d*(2*b*c - a*d)*(a + b*x)^(3/2) + 3*d^2*(a + b*x)^(5/2) - 15*Sqrt[a]*b^2*c^2*ArcTanh[Sqrt[a + b*x]/Sqrt[a]]))/105*b^3)

Maple [A] time = 0.007, size = 176, normalized size = 1.2

$$2 \frac{1}{b^3} \left(\frac{1}{7} d^2 f (bx+a)^{7/2} - \frac{2}{5} (bx+a)^{5/2} ad^2 f + \frac{2}{5} (bx+a)^{5/2} bcd f + \frac{1}{5} (bx+a)^{5/2} bd^2 e + \frac{1}{3} (bx+a)^{3/2} a^2 d^2 f - \frac{2}{3} \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((d*x+c)^2*(f*x+e)*(b*x+a)^(1/2)/x,x)

```
[Out] 2/b^3*(1/7*d^2*f*(b*x+a)^(7/2)-2/5*(b*x+a)^(5/2)*a*d^2*f+2/5*(b*x+a)^(5/2)*
b*c*d*f+1/5*(b*x+a)^(5/2)*b*d^2*e+1/3*(b*x+a)^(3/2)*a^2*d^2*f-2/3*(b*x+a)^(
3/2)*a*b*c*d*f-1/3*(b*x+a)^(3/2)*a*b*d^2*e+1/3*(b*x+a)^(3/2)*b^2*c^2*f+2/3*
(b*x+a)^(3/2)*b^2*c*d*e+b^3*c^2*e*(b*x+a)^(1/2)-a^(1/2)*b^3*c^2*e*arctanh((
b*x+a)^(1/2)/a^(1/2)))
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*x+c)^2*(f*x+e)*(b*x+a)^(1/2)/x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 1.36354, size = 914, normalized size = 6.3

$$\left[\frac{105 \sqrt{a} b^3 c^2 e \log\left(\frac{bx - 2\sqrt{bx+a}\sqrt{a+2a}}{x}\right) + 2(15b^3 d^2 f x^3 + 3(7b^3 d^2 e + (14b^3 cd + ab^2 d^2)f)x^2 + 7(15b^3 c^2 + 10ab^2 cd - 2a^2 d^2)e)x + 2(15b^3 d^2 f x^3 + 3(7b^3 d^2 e + (14b^3 cd + ab^2 d^2)f)x^2 + 7(15b^3 c^2 + 10ab^2 cd - 2a^2 d^2)e)x}{105b^3} \right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*x+c)^2*(f*x+e)*(b*x+a)^(1/2)/x,x, algorithm="fricas")
```

```
[Out] [1/105*(105*sqrt(a)*b^3*c^2*e*log((b*x - 2*sqrt(b*x + a)*sqrt(a) + 2*a)/x)
+ 2*(15*b^3*d^2*f*x^3 + 3*(7*b^3*d^2*e + (14*b^3*c*d + a*b^2*d^2)*f)*x^2 +
7*(15*b^3*c^2 + 10*a*b^2*c*d - 2*a^2*b*d^2)*e + (35*a*b^2*c^2 - 28*a^2*b*c*
d + 8*a^3*d^2)*f + (7*(10*b^3*c*d + a*b^2*d^2)*e + (35*b^3*c^2 + 14*a*b^2*c
*d - 4*a^2*b*d^2)*f)*x)*sqrt(b*x + a))/b^3, 2/105*(105*sqrt(-a)*b^3*c^2*e*a
rctan(sqrt(b*x + a)*sqrt(-a)/a) + (15*b^3*d^2*f*x^3 + 3*(7*b^3*d^2*e + (14*
b^3*c*d + a*b^2*d^2)*f)*x^2 + 7*(15*b^3*c^2 + 10*a*b^2*c*d - 2*a^2*b*d^2)*e
+ (35*a*b^2*c^2 - 28*a^2*b*c*d + 8*a^3*d^2)*f + (7*(10*b^3*c*d + a*b^2*d^2
)*e + (35*b^3*c^2 + 14*a*b^2*c*d - 4*a^2*b*d^2)*f)*x)*sqrt(b*x + a))/b^3]
```

Sympy [A] time = 18.6783, size = 167, normalized size = 1.15

$$\frac{2ac^2e \operatorname{atan}\left(\frac{\sqrt{a+bx}}{\sqrt{-a}}\right)}{\sqrt{-a}} + 2c^2e\sqrt{a+bx} + \frac{2d^2f(a+bx)^{\frac{7}{2}}}{7b^3} + \frac{2(a+bx)^{\frac{5}{2}}(-2ad^2f + 2bcd^2f + bd^2e)}{5b^3} + \frac{2(a+bx)^{\frac{3}{2}}(a^2d^2f - 2ab^2d^2f + b^3d^2e)}{5b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d*x+c)**2*(f*x+e)*(b*x+a)**(1/2)/x,x)

[Out] 2*a*c**2*e*atan(sqrt(a + b*x)/sqrt(-a))/sqrt(-a) + 2*c**2*e*sqrt(a + b*x) + 2*d**2*f*(a + b*x)**(7/2)/(7*b**3) + 2*(a + b*x)**(5/2)*(-2*a*d**2*f + 2*b*c*d*f + b*d**2*e)/(5*b**3) + 2*(a + b*x)**(3/2)*(a**2*d**2*f - 2*a*b*c*d*f - a*b*d**2*e + b**2*c**2*f + 2*b**2*c*d*e)/(3*b**3)

Giac [A] time = 1.75434, size = 271, normalized size = 1.87

$$\frac{2ac^2 \arctan\left(\frac{\sqrt{bx+a}}{\sqrt{-a}}\right)e}{\sqrt{-a}} + \frac{2\left(35(bx+a)^{\frac{3}{2}}b^{20}c^2f + 42(bx+a)^{\frac{5}{2}}b^{19}cdf - 70(bx+a)^{\frac{3}{2}}ab^{19}cdf + 15(bx+a)^{\frac{7}{2}}b^{18}d^2f - 42(bx+a)^{\frac{5}{2}}b^{17}d^2e + 35(bx+a)^{\frac{3}{2}}b^{16}d^2e\right)}{5b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d*x+c)^2*(f*x+e)*(b*x+a)^(1/2)/x,x, algorithm="giac")

[Out] 2*a*c^2*arctan(sqrt(b*x + a)/sqrt(-a))*e/sqrt(-a) + 2/105*(35*(b*x + a)^(3/2)*b^20*c^2*f + 42*(b*x + a)^(5/2)*b^19*c*d*f - 70*(b*x + a)^(3/2)*a*b^19*c*d*f + 15*(b*x + a)^(7/2)*b^18*d^2*f - 42*(b*x + a)^(5/2)*a*b^18*d^2*f + 35*(b*x + a)^(3/2)*a^2*b^18*d^2*f + 105*sqrt(b*x + a)*b^21*c^2*e + 70*(b*x + a)^(3/2)*b^20*c*d*e + 21*(b*x + a)^(5/2)*b^19*d^2*e - 35*(b*x + a)^(3/2)*a*b^19*d^2*e)/b^21

$$3.17 \quad \int \frac{\sqrt{a+bx}(c+dx)(e+fx)}{x} dx$$

Optimal. Leaf size=77

$$-\frac{2(a+bx)^{3/2}(2adf-5b(cf+de)-3bdfx)}{15b^2} + 2ce\sqrt{a+bx} - 2\sqrt{ace} \tanh^{-1}\left(\frac{\sqrt{a+bx}}{\sqrt{a}}\right)$$

[Out] 2*c*e*Sqrt[a + b*x] - (2*(a + b*x)^(3/2)*(2*a*d*f - 5*b*(d*e + c*f) - 3*b*d*f*x))/(15*b^2) - 2*Sqrt[a]*c*e*ArcTanh[Sqrt[a + b*x]/Sqrt[a]]

Rubi [A] time = 0.0235912, antiderivative size = 77, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.174$, Rules used = {147, 50, 63, 208}

$$-\frac{2(a+bx)^{3/2}(2adf-5b(cf+de)-3bdfx)}{15b^2} + 2ce\sqrt{a+bx} - 2\sqrt{ace} \tanh^{-1}\left(\frac{\sqrt{a+bx}}{\sqrt{a}}\right)$$

Antiderivative was successfully verified.

[In] Int[(Sqrt[a + b*x]*(c + d*x)*(e + f*x))/x,x]

[Out] 2*c*e*Sqrt[a + b*x] - (2*(a + b*x)^(3/2)*(2*a*d*f - 5*b*(d*e + c*f) - 3*b*d*f*x))/(15*b^2) - 2*Sqrt[a]*c*e*ArcTanh[Sqrt[a + b*x]/Sqrt[a]]

Rule 147

Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))*((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[((a*d*f*h*(n + 2) + b*c*f*h*(m + 2) - b*d*(f*g + e*h)*(m + n + 3) - b*d*f*h*(m + n + 2)*x)*(a + b*x)^(m + 1)*(c + d*x)^(n + 1))/(b^2*d^2*(m + n + 2)*(m + n + 3)), x] + Dist[(a^2*d^2*f*h*(n + 1)*(n + 2) + a*b*d*(n + 1)*(2*c*f*h*(m + 1) - d*(f*g + e*h)*(m + n + 3)) + b^2*(c^2*f*h*(m + 1)*(m + 2) - c*d*(f*g + e*h)*(m + 1)*(m + n + 3) + d^2*e*g*(m + n + 2)*(m + n + 3)))/(b^2*d^2*(m + n + 2)*(m + n + 3)), Int[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n}, x] && NeQ[m + n + 2, 0] && NeQ[m + n + 3, 0]

Rule 50

Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Simp[(a + b*x)^(m + 1)*(c + d*x)^n/(b*(m + n + 1)), x] + Dist[(n*(b*c - a*d))/

```
(b*(m + n + 1)), Int[(a + b*x)^m*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b,
c, d}, x] && NeQ[b*c - a*d, 0] && GtQ[n, 0] && NeQ[m + n + 1, 0] && !(IGtQ
[m, 0] && (!IntegerQ[n] || (GtQ[m, 0] && LtQ[m - n, 0]))) && !ILtQ[m + n
+ 2, 0] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rubi steps

$$\begin{aligned} \int \frac{\sqrt{a+bx}(c+dx)(e+fx)}{x} dx &= -\frac{2(a+bx)^{3/2}(2adf-5b(de+cf)-3bdfx)}{15b^2} + (ce) \int \frac{\sqrt{a+bx}}{x} dx \\ &= 2ce\sqrt{a+bx} - \frac{2(a+bx)^{3/2}(2adf-5b(de+cf)-3bdfx)}{15b^2} + (ace) \int \frac{1}{x\sqrt{a+bx}} dx \\ &= 2ce\sqrt{a+bx} - \frac{2(a+bx)^{3/2}(2adf-5b(de+cf)-3bdfx)}{15b^2} + \frac{(2ace) \operatorname{Subst}\left(\int \frac{1}{-\frac{a}{b}+\frac{x^2}{b}} dx, x\right)}{b} \\ &= 2ce\sqrt{a+bx} - \frac{2(a+bx)^{3/2}(2adf-5b(de+cf)-3bdfx)}{15b^2} - 2\sqrt{ace} \tanh^{-1}\left(\frac{\sqrt{a+bx}}{\sqrt{a}}\right) \end{aligned}$$

Mathematica [A] time = 0.123062, size = 87, normalized size = 1.13

$$\frac{2(a+bx)^{3/2}(-adf+bcf+bde)}{3b^2} + \frac{2df(a+bx)^{5/2}}{5b^2} + 2ce\sqrt{a+bx} - 2\sqrt{ace} \tanh^{-1}\left(\frac{\sqrt{a+bx}}{\sqrt{a}}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(Sqrt[a + b*x]*(c + d*x)*(e + f*x))/x,x]
```

```
[Out] 2*c*e*Sqrt[a + b*x] + (2*(b*d*e + b*c*f - a*d*f)*(a + b*x)^(3/2))/(3*b^2) +
(2*d*f*(a + b*x)^(5/2))/(5*b^2) - 2*Sqrt[a]*c*e*ArcTanh[Sqrt[a + b*x]/Sqrt
[a]]
```

Maple [A] time = 0.007, size = 89, normalized size = 1.2

$$2 \frac{1}{b^2} \left(\frac{1}{5} df (bx + a)^{5/2} - \frac{1}{3} (bx + a)^{3/2} adf + \frac{1}{3} (bx + a)^{3/2} bcf + \frac{1}{3} (bx + a)^{3/2} bde + b^2 ce \sqrt{bx + a} - \sqrt{ab^2 ce} \operatorname{Artanh} \right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*x+c)*(f*x+e)*(b*x+a)^(1/2)/x,x)
```

```
[Out] 2/b^2*(1/5*d*f*(b*x+a)^(5/2)-1/3*(b*x+a)^(3/2)*a*d*f+1/3*(b*x+a)^(3/2)*b*c*
f+1/3*(b*x+a)^(3/2)*b*d*e+b^2*c*e*(b*x+a)^(1/2)-a^(1/2)*b^2*c*e*arctanh((b*
x+a)^(1/2)/a^(1/2)))
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*x+c)*(f*x+e)*(b*x+a)^(1/2)/x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 1.22554, size = 517, normalized size = 6.71

$$\frac{15 \sqrt{ab^2 ce} \log\left(\frac{bx - 2\sqrt{bx+a}\sqrt{a+2a}}{x}\right) + 2(3b^2 dfx^2 + 5(3b^2c + abd)e + (5abc - 2a^2d)f + (5b^2de + (5b^2c + abd)f)x)\sqrt{bx+a}}{15b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*x+c)*(f*x+e)*(b*x+a)^(1/2)/x,x, algorithm="fricas")
```

[Out] $[1/15*(15*\sqrt{a}*b^2*c*e*\log((b*x - 2*\sqrt{b*x + a})*\sqrt{a} + 2*a)/x) + 2*(3*b^2*d*f*x^2 + 5*(3*b^2*c + a*b*d)*e + (5*a*b*c - 2*a^2*d)*f + (5*b^2*d*e + (5*b^2*c + a*b*d)*f)*x)*\sqrt{b*x + a})/b^2, 2/15*(15*\sqrt{-a}*b^2*c*e*\arctan(\sqrt{b*x + a}*\sqrt{-a}/a) + (3*b^2*d*f*x^2 + 5*(3*b^2*c + a*b*d)*e + (5*a*b*c - 2*a^2*d)*f + (5*b^2*d*e + (5*b^2*c + a*b*d)*f)*x)*\sqrt{b*x + a})/b^2]$

Sympy [A] time = 18.1863, size = 92, normalized size = 1.19

$$\frac{2ace \operatorname{atan}\left(\frac{\sqrt{a+bx}}{\sqrt{-a}}\right)}{\sqrt{-a}} + 2ce\sqrt{a+bx} + \frac{2df(a+bx)^{\frac{5}{2}}}{5b^2} + \frac{2(a+bx)^{\frac{3}{2}}(-adf+bcf+bde)}{3b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((d*x+c)*(f*x+e)*(b*x+a)**(1/2)/x,x)`

[Out] $2*a*c*e*\operatorname{atan}(\sqrt{a + b*x}/\sqrt{-a})/\sqrt{-a} + 2*c*e*\sqrt{a + b*x} + 2*d*f*(a + b*x)**(5/2)/(5*b**2) + 2*(a + b*x)**(3/2)*(-a*d*f + b*c*f + b*d*e)/(3*b**2)$

Giac [A] time = 2.75584, size = 142, normalized size = 1.84

$$\frac{2ac \operatorname{arctan}\left(\frac{\sqrt{bx+a}}{\sqrt{-a}}\right)e}{\sqrt{-a}} + \frac{2\left(5(bx+a)^{\frac{3}{2}}b^9cf + 3(bx+a)^{\frac{5}{2}}b^8df - 5(bx+a)^{\frac{3}{2}}ab^8df + 15\sqrt{bx+a}b^{10}ce + 5(bx+a)^{\frac{3}{2}}b^9de\right)}{15b^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((d*x+c)*(f*x+e)*(b*x+a)^(1/2)/x,x, algorithm="giac")`

[Out] $2*a*c*\operatorname{arctan}(\sqrt{b*x + a}/\sqrt{-a})*e/\sqrt{-a} + 2/15*(5*(b*x + a)^(3/2)*b^9*c*f + 3*(b*x + a)^(5/2)*b^8*d*f - 5*(b*x + a)^(3/2)*a*b^8*d*f + 15*\sqrt{b*x + a}*b^{10}*c*e + 5*(b*x + a)^(3/2)*b^9*d*e)/b^{10}$

$$3.18 \quad \int \frac{\sqrt{a+bx}(e+fx)}{x} dx$$

Optimal. Leaf size=54

$$2e\sqrt{a+bx} - 2\sqrt{ae} \tanh^{-1}\left(\frac{\sqrt{a+bx}}{\sqrt{a}}\right) + \frac{2f(a+bx)^{3/2}}{3b}$$

[Out] 2*e*Sqrt[a + b*x] + (2*f*(a + b*x)^(3/2))/(3*b) - 2*Sqrt[a]*e*ArcTanh[Sqrt[a + b*x]/Sqrt[a]]

Rubi [A] time = 0.0158209, antiderivative size = 54, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}} = 0.222$, Rules used = {80, 50, 63, 208}

$$2e\sqrt{a+bx} - 2\sqrt{ae} \tanh^{-1}\left(\frac{\sqrt{a+bx}}{\sqrt{a}}\right) + \frac{2f(a+bx)^{3/2}}{3b}$$

Antiderivative was successfully verified.

[In] Int[(Sqrt[a + b*x]*(e + f*x))/x,x]

[Out] 2*e*Sqrt[a + b*x] + (2*f*(a + b*x)^(3/2))/(3*b) - 2*Sqrt[a]*e*ArcTanh[Sqrt[a + b*x]/Sqrt[a]]

Rule 80

Int[((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p_.), x_Symbol] := Simp[(b*(c + d*x)^(n + 1)*(e + f*x)^(p + 1))/(d*f*(n + p + 2)), x] + Dist[(a*d*f*(n + p + 2) - b*(d*e*(n + 1) + c*f*(p + 1)))/(d*f*(n + p + 2)), Int[(c + d*x)^n*(e + f*x)^p, x], x] /; FreeQ[{a, b, c, d, e, f, n, p}, x] && NeQ[n + p + 2, 0]

Rule 50

Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] := Simp[((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + n + 1)), x] + Dist[(n*(b*c - a*d))/(b*(m + n + 1)), Int[(a + b*x)^m*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0] && GtQ[n, 0] && NeQ[m + n + 1, 0] && !(IGtQ[m, 0] && (!IntegerQ[n] || (GtQ[m, 0] && LtQ[m - n, 0]))) && !ILtQ[m + n + 2, 0] && IntLinearQ[a, b, c, d, m, n, x]

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] := With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] := Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rubi steps

$$\begin{aligned}
\int \frac{\sqrt{a+bx}(e+fx)}{x} dx &= \frac{2f(a+bx)^{3/2}}{3b} + e \int \frac{\sqrt{a+bx}}{x} dx \\
&= 2e\sqrt{a+bx} + \frac{2f(a+bx)^{3/2}}{3b} + (ae) \int \frac{1}{x\sqrt{a+bx}} dx \\
&= 2e\sqrt{a+bx} + \frac{2f(a+bx)^{3/2}}{3b} + \frac{(2ae) \operatorname{Subst}\left(\int \frac{1}{-\frac{a}{b} + \frac{x^2}{b}} dx, x, \sqrt{a+bx}\right)}{b} \\
&= 2e\sqrt{a+bx} + \frac{2f(a+bx)^{3/2}}{3b} - 2\sqrt{ae} \tanh^{-1}\left(\frac{\sqrt{a+bx}}{\sqrt{a}}\right)
\end{aligned}$$

Mathematica [A] time = 0.0462837, size = 55, normalized size = 1.02

$$e \left(2\sqrt{a+bx} - 2\sqrt{a} \tanh^{-1}\left(\frac{\sqrt{a+bx}}{\sqrt{a}}\right) \right) + \frac{2f(a+bx)^{3/2}}{3b}$$

Antiderivative was successfully verified.

```
[In] Integrate[(Sqrt[a + b*x]*(e + f*x))/x, x]
```

```
[Out] (2*f*(a + b*x)^(3/2))/(3*b) + e*(2*Sqrt[a + b*x] - 2*Sqrt[a]*ArcTanh[Sqrt[a
+ b*x]/Sqrt[a]])
```

Maple [A] time = 0.006, size = 46, normalized size = 0.9

$$2 \frac{1}{b} \left(\frac{1}{3} f (bx + a)^{3/2} + \sqrt{bx + a} be - \sqrt{a} eb \operatorname{Artanh} \left(\frac{\sqrt{bx + a}}{\sqrt{a}} \right) \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((f*x+e)*(b*x+a)^(1/2)/x,x)

[Out] 2/b*(1/3*f*(b*x+a)^(3/2)+(b*x+a)^(1/2)*b*e-a^(1/2)*e*b*arctanh((b*x+a)^(1/2)/a^(1/2)))

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((f*x+e)*(b*x+a)^(1/2)/x,x, algorithm="maxima")

[Out] Exception raised: ValueError

Fricas [A] time = 1.29334, size = 279, normalized size = 5.17

$$\left[\frac{3 \sqrt{a} b e \log \left(\frac{b x - 2 \sqrt{b x + a} \sqrt{a + 2 a}}{x} \right) + 2 (b f x + 3 b e + a f) \sqrt{b x + a}}{3 b}, \frac{2 \left(3 \sqrt{-a} b e \arctan \left(\frac{\sqrt{b x + a} \sqrt{-a}}{a} \right) + (b f x + 3 b e + a f) \sqrt{b x + a} \right)}{3 b} \right]$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((f*x+e)*(b*x+a)^(1/2)/x,x, algorithm="fricas")

[Out] [1/3*(3*sqrt(a)*b*e*log((b*x - 2*sqrt(b*x + a)*sqrt(a) + 2*a)/x) + 2*(b*f*x + 3*b*e + a*f)*sqrt(b*x + a))/b, 2/3*(3*sqrt(-a)*b*e*arctan(sqrt(b*x + a)*sqrt(-a)/a) + (b*f*x + 3*b*e + a*f)*sqrt(b*x + a))/b]

Sympy [A] time = 3.90109, size = 54, normalized size = 1.

$$\frac{2ae \operatorname{atan}\left(\frac{\sqrt{a+bx}}{\sqrt{-a}}\right)}{\sqrt{-a}} + 2e\sqrt{a+bx} + \frac{2f(a+bx)^{\frac{3}{2}}}{3b}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((f*x+e)*(b*x+a)**(1/2)/x,x)

[Out] 2*a*e*atan(sqrt(a + b*x)/sqrt(-a))/sqrt(-a) + 2*e*sqrt(a + b*x) + 2*f*(a + b*x)**(3/2)/(3*b)

Giac [A] time = 2.64331, size = 77, normalized size = 1.43

$$\frac{2a \arctan\left(\frac{\sqrt{bx+a}}{\sqrt{-a}}\right)e}{\sqrt{-a}} + \frac{2\left((bx+a)^{\frac{3}{2}}b^2f + 3\sqrt{bx+ab^3}e\right)}{3b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((f*x+e)*(b*x+a)^(1/2)/x,x, algorithm="giac")

[Out] 2*a*arctan(sqrt(b*x + a)/sqrt(-a))*e/sqrt(-a) + 2/3*((b*x + a)^(3/2)*b^2*f + 3*sqrt(b*x + a)*b^3*e)/b^3

$$3.19 \quad \int \frac{\sqrt{a+bx}(e+fx)}{x(c+dx)} dx$$

Optimal. Leaf size=101

$$\frac{2\sqrt{bc-ad}(de-cf)\tan^{-1}\left(\frac{\sqrt{d}\sqrt{a+bx}}{\sqrt{bc-ad}}\right)}{cd^{3/2}} - \frac{2\sqrt{ae}\tanh^{-1}\left(\frac{\sqrt{a+bx}}{\sqrt{a}}\right)}{c} + \frac{2f\sqrt{a+bx}}{d}$$

[Out] (2*f*Sqrt[a + b*x])/d + (2*Sqrt[b*c - a*d]*(d*e - c*f)*ArcTan[(Sqrt[d]*Sqrt[a + b*x])/Sqrt[b*c - a*d]]/(c*d^(3/2)) - (2*Sqrt[a]*e*ArcTanh[Sqrt[a + b*x]/Sqrt[a]])/c

Rubi [A] time = 0.11897, antiderivative size = 101, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.2$, Rules used = {154, 156, 63, 208, 205}

$$\frac{2\sqrt{bc-ad}(de-cf)\tan^{-1}\left(\frac{\sqrt{d}\sqrt{a+bx}}{\sqrt{bc-ad}}\right)}{cd^{3/2}} - \frac{2\sqrt{ae}\tanh^{-1}\left(\frac{\sqrt{a+bx}}{\sqrt{a}}\right)}{c} + \frac{2f\sqrt{a+bx}}{d}$$

Antiderivative was successfully verified.

[In] Int[(Sqrt[a + b*x]*(e + f*x))/(x*(c + d*x)),x]

[Out] (2*f*Sqrt[a + b*x])/d + (2*Sqrt[b*c - a*d]*(d*e - c*f)*ArcTan[(Sqrt[d]*Sqrt[a + b*x])/Sqrt[b*c - a*d]]/(c*d^(3/2)) - (2*Sqrt[a]*e*ArcTanh[Sqrt[a + b*x]/Sqrt[a]])/c

Rule 154

Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_)*((e_.) + (f_.)*(x_))^(p_)*((g_.) + (h_.)*(x_)), x_Symbol] :> Simp[(h*(a + b*x)^(m*(c + d*x)^(n + 1)*(e + f*x)^(p + 1))/(d*f*(m + n + p + 2)), x] + Dist[1/(d*f*(m + n + p + 2)), Int[(a + b*x)^(m - 1)*(c + d*x)^(n*(e + f*x)^p*Simp[a*d*f*g*(m + n + p + 2) - h*(b*c*e*m + a*(d*e*(n + 1) + c*f*(p + 1))] + (b*d*f*g*(m + n + p + 2) + h*(a*d*f*m - b*(d*e*(m + n + 1) + c*f*(m + p + 1))))*x, x], x] / ; FreeQ[{a, b, c, d, e, f, g, h, n, p}, x] && GtQ[m, 0] && NeQ[m + n + p + 2, 0] && IntegersQ[2*m, 2*n, 2*p]

Rule 156

Int[(((e_.) + (f_.)*(x_))^(p_)*((g_.) + (h_.)*(x_)))/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[(b*g - a*h)/(b*c - a*d), Int[(e +

$f*x)^p/(a + b*x), x], x] - \text{Dist}[(d*g - c*h)/(b*c - a*d), \text{Int}[(e + f*x)^p/(c + d*x), x], x] /; \text{FreeQ}\{a, b, c, d, e, f, g, h\}, x]$

Rule 63

$\text{Int}[(a_.) + (b_.)*(x_)^m]*((c_.) + (d_.)*(x_)^n), x_Symbol] := \text{With}[\{p = \text{Denominator}[m]\}, \text{Dist}[p/b, \text{Subst}[\text{Int}[x^{p*(m+1)-1}*(c - (a*d)/b + (d*x^p)/b)^n, x], x, (a + b*x)^{1/p}], x]] /; \text{FreeQ}\{a, b, c, d\}, x] \&\& \text{NeQ}[b*c - a*d, 0] \&\& \text{LtQ}[-1, m, 0] \&\& \text{LeQ}[-1, n, 0] \&\& \text{LeQ}[\text{Denominator}[n], \text{Denominator}[m]] \&\& \text{IntLinearQ}[a, b, c, d, m, n, x]$

Rule 208

$\text{Int}[(a_.) + (b_.)*(x_)^2]^{-1}, x_Symbol] := \text{Simp}[(\text{Rt}[-(a/b), 2]*\text{ArcTanh}[x/\text{Rt}[-(a/b), 2]])/a, x] /; \text{FreeQ}\{a, b\}, x] \&\& \text{NegQ}[a/b]$

Rule 205

$\text{Int}[(a_.) + (b_.)*(x_)^2]^{-1}, x_Symbol] := \text{Simp}[(\text{Rt}[a/b, 2]*\text{ArcTan}[x/\text{Rt}[a/b, 2]])/a, x] /; \text{FreeQ}\{a, b\}, x] \&\& \text{PosQ}[a/b]$

Rubi steps

$$\begin{aligned} \int \frac{\sqrt{a+bx}(e+fx)}{x(c+dx)} dx &= \frac{2f\sqrt{a+bx}}{d} + \frac{2 \int \frac{\frac{ade}{2} + \frac{1}{2}(bde-bcf+adf)x}{x\sqrt{a+bx}(c+dx)} dx}{d} \\ &= \frac{2f\sqrt{a+bx}}{d} + \frac{(ae) \int \frac{1}{x\sqrt{a+bx}} dx}{c} + \frac{((bc-ad)(de-cf)) \int \frac{1}{\sqrt{a+bx}(c+dx)} dx}{cd} \\ &= \frac{2f\sqrt{a+bx}}{d} + \frac{(2ae) \text{Subst}\left(\int \frac{1}{-\frac{a}{b} + \frac{x^2}{b}} dx, x, \sqrt{a+bx}\right)}{bc} + \frac{(2(bc-ad)(de-cf)) \text{Subst}\left(\int \frac{1}{c - \frac{ad}{b} + \frac{dx^2}{b}}\right)}{bcd} \\ &= \frac{2f\sqrt{a+bx}}{d} + \frac{2\sqrt{bc-ad}(de-cf) \tan^{-1}\left(\frac{\sqrt{d}\sqrt{a+bx}}{\sqrt{bc-ad}}\right)}{cd^{3/2}} - \frac{2\sqrt{ae} \tanh^{-1}\left(\frac{\sqrt{a+bx}}{\sqrt{a}}\right)}{c} \end{aligned}$$

Mathematica [A] time = 0.218331, size = 100, normalized size = 0.99

$$\frac{-\frac{2\sqrt{bc-ad}(cf-de) \tan^{-1}\left(\frac{\sqrt{d}\sqrt{a+bx}}{\sqrt{bc-ad}}\right)}{d^{3/2}} + \frac{2cf\sqrt{a+bx}}{d} - 2\sqrt{ae} \tanh^{-1}\left(\frac{\sqrt{a+bx}}{\sqrt{a}}\right)}{c}$$

Antiderivative was successfully verified.

[In] Integrate[(Sqrt[a + b*x]*(e + f*x))/(x*(c + d*x)),x]

[Out] $\left(\frac{2cf\sqrt{a+bx}}{d} - (2\sqrt{bc-ad}(-(d*e) + cf)\operatorname{ArcTan}\left[\frac{\sqrt{d}\sqrt{a+bx}}{\sqrt{bc-ad}}\right])\right)/d^{3/2} - 2\sqrt{a}e\operatorname{ArcTanh}\left[\frac{\sqrt{a+bx}}{\sqrt{a}}\right]/c$

Maple [A] time = 0.013, size = 103, normalized size = 1.

$$2\frac{f\sqrt{bx+a}}{d} - 2\frac{acdf - ad^2e - bc^2f + bcde}{dc\sqrt{(ad-bc)d}}\operatorname{Artanh}\left(\frac{\sqrt{bx+ad}}{\sqrt{(ad-bc)d}}\right) - 2\frac{e\sqrt{a}}{c}\operatorname{Artanh}\left(\frac{\sqrt{bx+a}}{\sqrt{a}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((f*x+e)*(b*x+a)^(1/2)/x/(d*x+c),x)

[Out] $2f*(b*x+a)^{1/2}/d - 2/d*(a*c*d*f - a*d^2*e - b*c^2*f + b*c*d*e)/c/((a*d - b*c)*d)^{1/2} * \operatorname{arctanh}((b*x+a)^{1/2}*d/((a*d - b*c)*d)^{1/2}) - 2*e*\operatorname{arctanh}((b*x+a)^{1/2}/a^{1/2})*a^{1/2}/c$

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((f*x+e)*(b*x+a)^(1/2)/x/(d*x+c),x, algorithm="maxima")

[Out] Exception raised: ValueError

Fricas [A] time = 1.64713, size = 1013, normalized size = 10.03

$$\left[\frac{\sqrt{ade} \log\left(\frac{bx-2\sqrt{bx+a}\sqrt{a+2a}}{x}\right) + 2\sqrt{bx+ac}f - (de - cf)\sqrt{-\frac{bc-ad}{d}} \log\left(\frac{bdx-bc+2ad-2\sqrt{bx+ad}\sqrt{-\frac{bc-ad}{d}}}{dx+c}\right)}{cd}, 2\sqrt{-ade} \operatorname{arctan}\left(\frac{\sqrt{bx+a}}{\sqrt{a}}\right) \right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)*(b*x+a)^(1/2)/x/(d*x+c),x, algorithm="fricas")
```

```
[Out] [(sqrt(a)*d*e*log((b*x - 2*sqrt(b*x + a)*sqrt(a) + 2*a)/x) + 2*sqrt(b*x + a)
)*c*f - (d*e - c*f)*sqrt(-(b*c - a*d)/d)*log((b*d*x - b*c + 2*a*d - 2*sqrt(
b*x + a)*d*sqrt(-(b*c - a*d)/d))/(d*x + c)))/(c*d), (2*sqrt(-a)*d*e*arctan(
sqrt(b*x + a)*sqrt(-a)/a) + 2*sqrt(b*x + a)*c*f - (d*e - c*f)*sqrt(-(b*c -
a*d)/d)*log((b*d*x - b*c + 2*a*d - 2*sqrt(b*x + a)*d*sqrt(-(b*c - a*d)/d))/
(d*x + c)))/(c*d), (sqrt(a)*d*e*log((b*x - 2*sqrt(b*x + a)*sqrt(a) + 2*a)/x
) + 2*sqrt(b*x + a)*c*f - 2*(d*e - c*f)*sqrt((b*c - a*d)/d)*arctan(-sqrt(b*
x + a)*d*sqrt((b*c - a*d)/d)/(b*c - a*d)))/(c*d), 2*(sqrt(-a)*d*e*arctan(sq
rt(b*x + a)*sqrt(-a)/a) + sqrt(b*x + a)*c*f - (d*e - c*f)*sqrt((b*c - a*d)/
d)*arctan(-sqrt(b*x + a)*d*sqrt((b*c - a*d)/d)/(b*c - a*d)))/(c*d)]
```

Sympy [A] time = 15.252, size = 100, normalized size = 0.99

$$\frac{2ae \operatorname{atan}\left(\frac{\sqrt{a+bx}}{\sqrt{-a}}\right)}{c\sqrt{-a}} + \frac{2f\sqrt{a+bx}}{d} + \frac{2(ad-bc)(cf-de) \operatorname{atan}\left(\frac{\sqrt{a+bx}}{\sqrt{\frac{ad-bc}{d}}}\right)}{cd^2\sqrt{\frac{ad-bc}{d}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)*(b*x+a)**(1/2)/x/(d*x+c),x)
```

```
[Out] 2*a*e*atan(sqrt(a + b*x)/sqrt(-a))/(c*sqrt(-a)) + 2*f*sqrt(a + b*x)/d + 2*(
a*d - b*c)*(c*f - d*e)*atan(sqrt(a + b*x)/sqrt(-(a*d - b*c)/d))/(c*d**2*sq
rt(-(a*d - b*c)/d))
```

Giac [A] time = 2.62353, size = 151, normalized size = 1.5

$$\frac{2a \operatorname{arctan}\left(\frac{\sqrt{bx+a}}{\sqrt{-a}}\right) e}{\sqrt{-ac}} + \frac{2\sqrt{bx+af}}{d} - \frac{2(bc^2f - acdf - bcde + ad^2e) \operatorname{arctan}\left(\frac{\sqrt{bx+ad}}{\sqrt{bcd-ad^2}}\right)}{\sqrt{bcd-ad^2}cd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)*(b*x+a)^(1/2)/x/(d*x+c),x, algorithm="giac")
```



```
[Out] 2*a*arctan(sqrt(b*x + a)/sqrt(-a))*e/(sqrt(-a)*c) + 2*sqrt(b*x + a)*f/d - 2
*(b*c^2*f - a*c*d*f - b*c*d*e + a*d^2*e)*arctan(sqrt(b*x + a)*d/sqrt(b*c*d
- a*d^2))/(sqrt(b*c*d - a*d^2)*c*d)
```

3.20 $\int \frac{\sqrt{a+bx}(e+fx)}{x(c+dx)^2} dx$

Optimal. Leaf size=128

$$-\frac{(2ad^2e - bc(cf + de)) \tan^{-1}\left(\frac{\sqrt{d}\sqrt{a+bx}}{\sqrt{bc-ad}}\right)}{c^2d^{3/2}\sqrt{bc-ad}} - \frac{2\sqrt{ae} \tanh^{-1}\left(\frac{\sqrt{a+bx}}{\sqrt{a}}\right)}{c^2} + \frac{\sqrt{a+bx}(de - cf)}{cd(c+dx)}$$

[Out] ((d*e - c*f)*Sqrt[a + b*x])/(c*d*(c + d*x)) - ((2*a*d^2*e - b*c*(d*e + c*f))*ArcTan[(Sqrt[d]*Sqrt[a + b*x])/Sqrt[b*c - a*d]])/(c^2*d^(3/2)*Sqrt[b*c - a*d]) - (2*Sqrt[a]*e*ArcTanh[Sqrt[a + b*x]/Sqrt[a]])/c^2

Rubi [A] time = 0.115998, antiderivative size = 128, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.2$, Rules used = {149, 156, 63, 208, 205}

$$-\frac{(2ad^2e - bc(cf + de)) \tan^{-1}\left(\frac{\sqrt{d}\sqrt{a+bx}}{\sqrt{bc-ad}}\right)}{c^2d^{3/2}\sqrt{bc-ad}} - \frac{2\sqrt{ae} \tanh^{-1}\left(\frac{\sqrt{a+bx}}{\sqrt{a}}\right)}{c^2} + \frac{\sqrt{a+bx}(de - cf)}{cd(c+dx)}$$

Antiderivative was successfully verified.

[In] Int[(Sqrt[a + b*x]*(e + f*x))/(x*(c + d*x)^2), x]

[Out] ((d*e - c*f)*Sqrt[a + b*x])/(c*d*(c + d*x)) - ((2*a*d^2*e - b*c*(d*e + c*f))*ArcTan[(Sqrt[d]*Sqrt[a + b*x])/Sqrt[b*c - a*d]])/(c^2*d^(3/2)*Sqrt[b*c - a*d]) - (2*Sqrt[a]*e*ArcTanh[Sqrt[a + b*x]/Sqrt[a]])/c^2

Rule 149

Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_)*((e_.) + (f_.)*(x_))^(p_)*((g_.) + (h_.)*(x_)), x_Symbol] := Simp[((b*g - a*h)*(a + b*x)^(m + 1)*(c + d*x)^n*(e + f*x)^(p + 1))/(b*(b*e - a*f)*(m + 1)), x] - Dist[1/(b*(b*e - a*f)*(m + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^(n - 1)*(e + f*x)^p*Simp[b*c*(f*g - e*h)*(m + 1) + (b*g - a*h)*(d*e*n + c*f*(p + 1)) + d*(b*(f*g - e*h)*(m + 1) + f*(b*g - a*h)*(n + p + 1))*x, x], x] /; FreeQ[{a, b, c, d, e, f, g, h, p}, x] && LtQ[m, -1] && GtQ[n, 0] && IntegerQ[m]

Rule 156

Int[(((e_.) + (f_.)*(x_))^(p_)*((g_.) + (h_.)*(x_)))/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] := Dist[(b*g - a*h)/(b*c - a*d), Int[(e +

$f*x^p/(a + b*x), x], x] - \text{Dist}[(d*g - c*h)/(b*c - a*d), \text{Int}[(e + f*x)^p/(c + d*x), x], x] /; \text{FreeQ}\{a, b, c, d, e, f, g, h\}, x]$

Rule 63

$\text{Int}[(a_. + (b_.)*(x_.))^(m_.)*((c_.) + (d_.)*(x_.))^(n_.), x_Symbol] := \text{With}[\{p = \text{Denominator}[m]\}, \text{Dist}[p/b, \text{Subst}[\text{Int}[x^(p*(m + 1) - 1)*(c - (a*d)/b + (d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; \text{FreeQ}\{a, b, c, d\}, x] \&\& \text{NeQ}[b*c - a*d, 0] \&\& \text{LtQ}[-1, m, 0] \&\& \text{LeQ}[-1, n, 0] \&\& \text{LeQ}[\text{Denominator}[n], \text{Denominator}[m]] \&\& \text{IntLinearQ}[a, b, c, d, m, n, x]$

Rule 208

$\text{Int}[(a_. + (b_.)*(x_.)^2)^(-1), x_Symbol] := \text{Simp}[(\text{Rt}[-(a/b), 2]*\text{ArcTanh}[x/\text{Rt}[-(a/b), 2]])/a, x] /; \text{FreeQ}\{a, b\}, x] \&\& \text{NegQ}[a/b]$

Rule 205

$\text{Int}[(a_. + (b_.)*(x_.)^2)^(-1), x_Symbol] := \text{Simp}[(\text{Rt}[a/b, 2]*\text{ArcTan}[x/\text{Rt}[a/b, 2]])/a, x] /; \text{FreeQ}\{a, b\}, x] \&\& \text{PosQ}[a/b]$

Rubi steps

$$\begin{aligned} \int \frac{\sqrt{a+bx}(e+fx)}{x(c+dx)^2} dx &= \frac{(de-cf)\sqrt{a+bx}}{cd(c+dx)} - \frac{\int \frac{-ade-\frac{1}{2}b(de+cf)x}{x\sqrt{a+bx}(c+dx)} dx}{cd} \\ &= \frac{(de-cf)\sqrt{a+bx}}{cd(c+dx)} + \frac{(ae) \int \frac{1}{x\sqrt{a+bx}} dx}{c^2} - \frac{(2ad^2e - bc(de+cf)) \int \frac{1}{\sqrt{a+bx}(c+dx)} dx}{2c^2d} \\ &= \frac{(de-cf)\sqrt{a+bx}}{cd(c+dx)} + \frac{(2ae) \text{Subst}\left(\int \frac{1}{\frac{a}{-b} + \frac{x^2}{b}} dx, x, \sqrt{a+bx}\right)}{bc^2} - \frac{(2ad^2e - bc(de+cf)) \text{Subst}\left(\int \frac{1}{\sqrt{a+bx}(c+dx)} dx, x, \sqrt{a+bx}\right)}{bc^2d} \\ &= \frac{(de-cf)\sqrt{a+bx}}{cd(c+dx)} - \frac{(2ad^2e - bc(de+cf)) \tan^{-1}\left(\frac{\sqrt{d}\sqrt{a+bx}}{\sqrt{bc-ad}}\right)}{c^2d^{3/2}\sqrt{bc-ad}} - \frac{2\sqrt{ae} \tanh^{-1}\left(\frac{\sqrt{a+bx}}{\sqrt{a}}\right)}{c^2} \end{aligned}$$

Mathematica [A] time = 0.191439, size = 122, normalized size = 0.95

$$\frac{(bc(cf+de)-2ad^2e) \tan^{-1}\left(\frac{\sqrt{d}\sqrt{a+bx}}{\sqrt{bc-ad}}\right)}{d^{3/2}\sqrt{bc-ad}} + \frac{c\sqrt{a+bx}(de-cf)}{d(c+dx)} - 2\sqrt{ae} \tanh^{-1}\left(\frac{\sqrt{a+bx}}{\sqrt{a}}\right)}{c^2}$$

Antiderivative was successfully verified.

[In] Integrate[(Sqrt[a + b*x]*(e + f*x))/(x*(c + d*x)^2), x]

[Out] ((c*(d*e - c*f)*Sqrt[a + b*x])/(d*(c + d*x)) + ((-2*a*d^2*e + b*c*(d*e + c*f))*ArcTan[(Sqrt[d]*Sqrt[a + b*x])/Sqrt[b*c - a*d]])/(d^(3/2)*Sqrt[b*c - a*d]) - 2*Sqrt[a]*e*ArcTanh[Sqrt[a + b*x]/Sqrt[a]]/c^2

Maple [A] time = 0.016, size = 137, normalized size = 1.1

$$2b \left(-\frac{1}{bc^2} \left(\frac{1}{2} \frac{bc(cf - de)\sqrt{bx+a}}{d((bx+a)d - ad + bc)} - \frac{1}{2} \frac{2ad^2e - bc^2f - bcde}{d\sqrt{(ad-bc)d}} \operatorname{Artanh} \left(\frac{\sqrt{bx+ad}}{\sqrt{(ad-bc)d}} \right) \right) - \frac{\sqrt{ae}}{bc^2} \operatorname{Artanh} \left(\frac{\sqrt{bx+a}}{\sqrt{a}} \right) \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((f*x+e)*(b*x+a)^(1/2)/x/(d*x+c)^2,x)

[Out] 2*b*(-1/b/c^2*(1/2*b*c*(c*f-d*e)/d*(b*x+a)^(1/2)/((b*x+a)*d-a*d+b*c)-1/2*(2*a*d^2*e-b*c^2*f-b*c*d*e)/d/((a*d-b*c)*d)^(1/2)*arctanh((b*x+a)^(1/2)*d/((a*d-b*c)*d)^(1/2))-a^(1/2)*e/b/c^2*arctanh((b*x+a)^(1/2)/a^(1/2)))

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((f*x+e)*(b*x+a)^(1/2)/x/(d*x+c)^2,x, algorithm="maxima")

[Out] Exception raised: ValueError

Fricas [B] time = 1.95887, size = 2118, normalized size = 16.55

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)*(b*x+a)^(1/2)/x/(d*x+c)^2,x, algorithm="fricas")
```

```
[Out] [-1/2*((b*c^3*f + (b*c^2*d - 2*a*c*d^2)*e + (b*c^2*d*f + (b*c*d^2 - 2*a*d^3)*e)*x)*sqrt(-b*c*d + a*d^2)*log((b*d*x - b*c + 2*a*d - 2*sqrt(-b*c*d + a*d^2)*sqrt(b*x + a))/(d*x + c)) - 2*((b*c*d^3 - a*d^4)*e*x + (b*c^2*d^2 - a*c*d^3)*e)*sqrt(a)*log((b*x - 2*sqrt(b*x + a)*sqrt(a) + 2*a)/x) - 2*((b*c^2*d^2 - a*c*d^3)*e - (b*c^3*d - a*c^2*d^2)*f)*sqrt(b*x + a))/(b*c^4*d^2 - a*c^3*d^3 + (b*c^3*d^3 - a*c^2*d^4)*x), 1/2*(4*((b*c*d^3 - a*d^4)*e*x + (b*c^2*d^2 - a*c*d^3)*e)*sqrt(-a)*arctan(sqrt(b*x + a)*sqrt(-a)/a) - (b*c^3*f + (b*c^2*d - 2*a*c*d^2)*e + (b*c^2*d*f + (b*c*d^2 - 2*a*d^3)*e)*x)*sqrt(-b*c*d + a*d^2)*log((b*d*x - b*c + 2*a*d - 2*sqrt(-b*c*d + a*d^2)*sqrt(b*x + a))/(d*x + c)) + 2*((b*c^2*d^2 - a*c*d^3)*e - (b*c^3*d - a*c^2*d^2)*f)*sqrt(b*x + a))/(b*c^4*d^2 - a*c^3*d^3 + (b*c^3*d^3 - a*c^2*d^4)*x), -((b*c^3*f + (b*c^2*d - 2*a*c*d^2)*e + (b*c^2*d*f + (b*c*d^2 - 2*a*d^3)*e)*x)*sqrt(b*c*d - a*d^2)*arctan(sqrt(b*c*d - a*d^2)*sqrt(b*x + a)/(b*d*x + a*d)) - ((b*c*d^3 - a*d^4)*e*x + (b*c^2*d^2 - a*c*d^3)*e)*sqrt(a)*log((b*x - 2*sqrt(b*x + a)*sqrt(a) + 2*a)/x) - ((b*c^2*d^2 - a*c*d^3)*e - (b*c^3*d - a*c^2*d^2)*f)*sqrt(b*x + a))/(b*c^4*d^2 - a*c^3*d^3 + (b*c^3*d^3 - a*c^2*d^4)*x), -((b*c^3*f + (b*c^2*d - 2*a*c*d^2)*e + (b*c^2*d*f + (b*c*d^2 - 2*a*d^3)*e)*x)*sqrt(b*c*d - a*d^2)*arctan(sqrt(b*c*d - a*d^2)*sqrt(b*x + a)/(b*d*x + a*d)) - 2*((b*c*d^3 - a*d^4)*e*x + (b*c^2*d^2 - a*c*d^3)*e)*sqrt(-a)*arctan(sqrt(b*x + a)*sqrt(-a)/a) - ((b*c^2*d^2 - a*c*d^3)*e - (b*c^3*d - a*c^2*d^2)*f)*sqrt(b*x + a))/(b*c^4*d^2 - a*c^3*d^3 + (b*c^3*d^3 - a*c^2*d^4)*x)]
```

Sympy [B] time = 54.0157, size = 1149, normalized size = 8.98

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)*(b*x+a)**(1/2)/x/(d*x+c)**2,x)
```

```
[Out] 2*a*b*d*e*sqrt(a + b*x)/(2*a*b*c**2*d + 2*a*b*c*d**2*x - 2*b**2*c**3 - 2*b**2*c**2*d*x) - a*b*f*sqrt(1/(d*(a*d - b*c)**3))*log(-a**2*d**2*sqrt(1/(d*(a*d - b*c)**3)) + 2*a*b*c*d*sqrt(1/(d*(a*d - b*c)**3)) - b**2*c**2*sqrt(1/(d*(a*d - b*c)**3)) + sqrt(a + b*x))/2 + a*b*f*sqrt(1/(d*(a*d - b*c)**3))*log(a**2*d**2*sqrt(1/(d*(a*d - b*c)**3)) - 2*a*b*c*d*sqrt(1/(d*(a*d - b*c)**3)) + b**2*c**2*sqrt(1/(d*(a*d - b*c)**3)) + sqrt(a + b*x))/2 - 2*a*b*f*sqrt(a + b*x)/(2*a*b*c*d + 2*a*b*d**2*x - 2*b**2*c**2 - 2*b**2*c*d*x) + a*b*d*e*sqrt(1/(d*(a*d - b*c)**3))*log(-a**2*d**2*sqrt(1/(d*(a*d - b*c)**3)) + 2*a*b*c*d*sqrt(1/(d*(a*d - b*c)**3)) - b**2*c**2*sqrt(1/(d*(a*d - b*c)**3)) + sqrt(a + b*x))/(2*c) - a*b*d*e*sqrt(1/(d*(a*d - b*c)**3))*log(a**2*d**2*sqrt
```

```
(1/(d*(a*d - b*c)**3)) - 2*a*b*c*d*sqrt(1/(d*(a*d - b*c)**3)) + b**2*c**2*sqrt(1/(d*(a*d - b*c)**3)) + sqrt(a + b*x))/(2*c) - 2*a*e*atan(sqrt(a + b*x)/sqrt(-a + b*c/d))/(c**2*sqrt(-a + b*c/d)) + 2*a*e*atan(sqrt(a + b*x)/sqrt(-a))/(c**2*sqrt(-a)) + 2*b**2*c*f*sqrt(a + b*x)/(2*a*b*c*d**2 + 2*a*b*d**3*x - 2*b**2*c**2*d - 2*b**2*c*d**2*x) + b**2*c*f*sqrt(1/(d*(a*d - b*c)**3))*log(-a**2*d**2*sqrt(1/(d*(a*d - b*c)**3)) + 2*a*b*c*d*sqrt(1/(d*(a*d - b*c)**3)) - b**2*c**2*sqrt(1/(d*(a*d - b*c)**3)) + sqrt(a + b*x))/(2*d) - b**2*c*f*sqrt(1/(d*(a*d - b*c)**3))*log(a**2*d**2*sqrt(1/(d*(a*d - b*c)**3)) - 2*a*b*c*d*sqrt(1/(d*(a*d - b*c)**3)) + b**2*c**2*sqrt(1/(d*(a*d - b*c)**3)) + sqrt(a + b*x))/(2*d) - b**2*e*sqrt(1/(d*(a*d - b*c)**3))*log(-a**2*d**2*sqrt(1/(d*(a*d - b*c)**3)) + 2*a*b*c*d*sqrt(1/(d*(a*d - b*c)**3)) - b**2*c**2*sqrt(1/(d*(a*d - b*c)**3)) + sqrt(a + b*x))/2 + b**2*e*sqrt(1/(d*(a*d - b*c)**3))*log(a**2*d**2*sqrt(1/(d*(a*d - b*c)**3)) - 2*a*b*c*d*sqrt(1/(d*(a*d - b*c)**3)) + b**2*c**2*sqrt(1/(d*(a*d - b*c)**3)) + sqrt(a + b*x))/2 - 2*b**2*e*sqrt(a + b*x)/(2*a*b*c*d + 2*a*b*d**2*x - 2*b**2*c**2 - 2*b**2*c*d*x) + 2*b*f*atan(sqrt(a + b*x)/sqrt(-a + b*c/d))/(d**2*sqrt(-a + b*c/d))
```

Giac [A] time = 2.68528, size = 192, normalized size = 1.5

$$\frac{2a \arctan\left(\frac{\sqrt{bx+a}}{\sqrt{-a}}\right) e}{\sqrt{-ac^2}} + \frac{(bc^2f + bcde - 2ad^2e) \arctan\left(\frac{\sqrt{bx+ad}}{\sqrt{bcd-ad^2}}\right)}{\sqrt{bcd - ad^2c^2d}} - \frac{\sqrt{bx+abcf} - \sqrt{bx+abde}}{(bc + (bx+a)d - ad)cd}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((f*x+e)*(b*x+a)^(1/2)/x/(d*x+c)^2,x, algorithm="giac")

[Out] 2*a*arctan(sqrt(b*x + a)/sqrt(-a))*e/(sqrt(-a)*c^2) + (b*c^2*f + b*c*d*e - 2*a*d^2*e)*arctan(sqrt(b*x + a)*d/sqrt(b*c*d - a*d^2))/(sqrt(b*c*d - a*d^2)*c^2*d) - (sqrt(b*x + a)*b*c*f - sqrt(b*x + a)*b*d*e)/((b*c + (b*x + a)*d - a*d)*c*d)

$$3.21 \quad \int \frac{\sqrt{a+bx}(e+fx)}{x(c+dx)^3} dx$$

Optimal. Leaf size=205

$$\frac{(-8a^2d^3e + 12abcd^2e - b^2c^2(cf + 3de)) \tan^{-1}\left(\frac{\sqrt{d}\sqrt{a+bx}}{\sqrt{bc-ad}}\right)}{4c^3d^{3/2}(bc - ad)^{3/2}} - \frac{\sqrt{a+bx}(4ad^2e - bc(cf + 3de))}{4c^2d(c + dx)(bc - ad)} - \frac{2\sqrt{ae} \tanh^{-1}\left(\frac{\sqrt{a+bx}}{\sqrt{a}}\right)}{c^3} +$$

[Out] $((d*e - c*f)*\text{Sqrt}[a + b*x])/(2*c*d*(c + d*x)^2) - ((4*a*d^2*e - b*c*(3*d*e + c*f))*\text{Sqrt}[a + b*x])/(4*c^2*d*(b*c - a*d)*(c + d*x)) - ((12*a*b*c*d^2*e - 8*a^2*d^3*e - b^2*c^2*(3*d*e + c*f))*\text{ArcTan}[(\text{Sqrt}[d]*\text{Sqrt}[a + b*x])/\text{Sqrt}[b*c - a*d]])/(4*c^3*d^{(3/2)}*(b*c - a*d)^{(3/2)}) - (2*\text{Sqrt}[a]*e*\text{ArcTanh}[\text{Sqrt}[a + b*x]/\text{Sqrt}[a]])/c^3$

Rubi [A] time = 0.279463, antiderivative size = 205, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 6, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.24$, Rules used = {149, 151, 156, 63, 208, 205}

$$\frac{(-8a^2d^3e + 12abcd^2e - b^2c^2(cf + 3de)) \tan^{-1}\left(\frac{\sqrt{d}\sqrt{a+bx}}{\sqrt{bc-ad}}\right)}{4c^3d^{3/2}(bc - ad)^{3/2}} - \frac{\sqrt{a+bx}(4ad^2e - bc(cf + 3de))}{4c^2d(c + dx)(bc - ad)} - \frac{2\sqrt{ae} \tanh^{-1}\left(\frac{\sqrt{a+bx}}{\sqrt{a}}\right)}{c^3} +$$

Antiderivative was successfully verified.

[In] $\text{Int}[(\text{Sqrt}[a + b*x]*(e + f*x))/(x*(c + d*x)^3), x]$

[Out] $((d*e - c*f)*\text{Sqrt}[a + b*x])/(2*c*d*(c + d*x)^2) - ((4*a*d^2*e - b*c*(3*d*e + c*f))*\text{Sqrt}[a + b*x])/(4*c^2*d*(b*c - a*d)*(c + d*x)) - ((12*a*b*c*d^2*e - 8*a^2*d^3*e - b^2*c^2*(3*d*e + c*f))*\text{ArcTan}[(\text{Sqrt}[d]*\text{Sqrt}[a + b*x])/\text{Sqrt}[b*c - a*d]])/(4*c^3*d^{(3/2)}*(b*c - a*d)^{(3/2)}) - (2*\text{Sqrt}[a]*e*\text{ArcTanh}[\text{Sqrt}[a + b*x]/\text{Sqrt}[a]])/c^3$

Rule 149

$\text{Int}[(a_. + (b_.)*(x_.))^{(m_.)}*((c_.) + (d_.)*(x_.))^{(n_.)}*((e_.) + (f_.)*(x_.))^{(p_.)}*((g_.) + (h_.)*(x_.)), x_Symbol] \rightarrow \text{Simp}[(b*g - a*h)*(a + b*x)^{(m + 1)}*(c + d*x)^n*(e + f*x)^{(p + 1)}]/(b*(b*e - a*f)*(m + 1)), x] - \text{Dist}[1/(b*(b*e - a*f)*(m + 1)), \text{Int}[(a + b*x)^{(m + 1)}*(c + d*x)^{(n - 1)}*(e + f*x)^p \text{Simp}[b*c*(f*g - e*h)*(m + 1) + (b*g - a*h)*(d*e*n + c*f*(p + 1)) + d*(b*(f*g - e*h)*(m + 1) + f*(b*g - a*h)*(n + p + 1))*x, x], x] /; \text{FreeQ}\{a, b, c, d, e, f, g, h, p\}, x] \&\& \text{LtQ}[m, -1] \&\& \text{GtQ}[n, 0] \&\& \text{IntegerQ}[m]$

Rule 151

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_)*((e_.) + (f_.)*(x_))^(p_)*((g_.) + (h_.)*(x_)), x_Symbol] := Simp[((b*g - a*h)*(a + b*x)^(m + 1)*(c + d*x)^(n + 1)*(e + f*x)^(p + 1))/((m + 1)*(b*c - a*d)*(b*e - a*f)), x] + Dist[1/((m + 1)*(b*c - a*d)*(b*e - a*f)), Int[(a + b*x)^(m + 1)*(c + d*x)^n*(e + f*x)^p*Simp[(a*d*f*g - b*(d*e + c*f)*g + b*c*e*h]*(m + 1) - (b*g - a*h)*(d*e*(n + 1) + c*f*(p + 1)) - d*f*(b*g - a*h)*(m + n + p + 3)*x, x], x], x] /; FreeQ[{a, b, c, d, e, f, g, h, n, p}, x] && LtQ[m, -1] && IntegerQ[m]
```

Rule 156

```
Int[(((e_.) + (f_.)*(x_))^(p_)*((g_.) + (h_.)*(x_)))/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] := Dist[(b*g - a*h)/(b*c - a*d), Int[(e + f*x)^p/(a + b*x), x], x] - Dist[(d*g - c*h)/(b*c - a*d), Int[(e + f*x)^p/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] := With[{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b + (d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Denominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] := Simp[(Rt[-(a/b), 2]*ArcTanh[x/Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] := Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rubi steps

$$\begin{aligned}
\int \frac{\sqrt{a+bx}(e+fx)}{x(c+dx)^3} dx &= \frac{(de-cf)\sqrt{a+bx}}{2cd(c+dx)^2} - \frac{\int \frac{-2ade-\frac{1}{2}b(3de+cf)x}{x\sqrt{a+bx}(c+dx)^2} dx}{2cd} \\
&= \frac{(de-cf)\sqrt{a+bx}}{2cd(c+dx)^2} - \frac{(4ad^2e-bc(3de+cf))\sqrt{a+bx}}{4c^2d(bc-ad)(c+dx)} + \frac{\int \frac{2ad(bc-ad)e-\frac{1}{4}b(4ad^2e-bc(3de+cf))x}{x\sqrt{a+bx}(c+dx)} dx}{2c^2d(bc-ad)} \\
&= \frac{(de-cf)\sqrt{a+bx}}{2cd(c+dx)^2} - \frac{(4ad^2e-bc(3de+cf))\sqrt{a+bx}}{4c^2d(bc-ad)(c+dx)} + \frac{(ae) \int \frac{1}{x\sqrt{a+bx}} dx}{c^3} - \frac{(12abcd^2e-8a^2d^3e)}{c^3} \\
&= \frac{(de-cf)\sqrt{a+bx}}{2cd(c+dx)^2} - \frac{(4ad^2e-bc(3de+cf))\sqrt{a+bx}}{4c^2d(bc-ad)(c+dx)} + \frac{(2ae) \text{Subst} \left(\int \frac{1}{-\frac{a}{b}+\frac{x^2}{b}} dx, x, \sqrt{a+bx} \right)}{bc^3} \\
&= \frac{(de-cf)\sqrt{a+bx}}{2cd(c+dx)^2} - \frac{(4ad^2e-bc(3de+cf))\sqrt{a+bx}}{4c^2d(bc-ad)(c+dx)} - \frac{(12abcd^2e-8a^2d^3e-b^2c^2(3de+cf))}{4c^3d^{3/2}(bc-ad)^{3/2}}
\end{aligned}$$

Mathematica [A] time = 0.55004, size = 259, normalized size = 1.26

$$\frac{2 \left(\frac{(8a^2d^3e-12abcd^2e+b^2c^2(cf+3de)) \left(\sqrt{d}\sqrt{a+bx}-\sqrt{bc-ad} \tan^{-1} \left(\frac{\sqrt{d}\sqrt{a+bx}}{\sqrt{bc-ad}} \right) \right)}{4d^{3/2}} + 2e(bc-ad)^2 \left(\sqrt{a} \tanh^{-1} \left(\frac{\sqrt{a+bx}}{\sqrt{a}} \right) - \sqrt{a+bx} \right) \right)}{c^2(bc-ad)} - \frac{(a+bx)^{3/2}(4ad^2e+bc(cf-5de))}{2c(c+dx)(bc-ad)} + \frac{(a+bx)^{3/2}}{(c+dx)}$$

Antiderivative was successfully verified.

[In] Integrate[(Sqrt[a + b*x]*(e + f*x))/(x*(c + d*x)^3), x]

[Out] (((d*e - c*f)*(a + b*x)^(3/2))/(c + d*x)^2 - ((4*a*d^2*e + b*c*(-5*d*e + c*f))*(a + b*x)^(3/2))/(2*c*(b*c - a*d)*(c + d*x)) + (2*(((-12*a*b*c*d^2*e + 8*a^2*d^3*e + b^2*c^2*(3*d*e + c*f))*(Sqrt[d]*Sqrt[a + b*x] - Sqrt[b*c - a*d])*ArcTan[(Sqrt[d]*Sqrt[a + b*x])/Sqrt[b*c - a*d]]))/(4*d^(3/2)) + 2*(b*c - a*d)^2*e*(-Sqrt[a + b*x] + Sqrt[a]*ArcTanh[Sqrt[a + b*x]/Sqrt[a]]))/(c^2*(b*c - a*d)))/(2*c*(-(b*c) + a*d))

Maple [A] time = 0.014, size = 221, normalized size = 1.1

$$2b^2 \left(-\frac{1}{c^3b^2} \left(\frac{1}{((bx+a)d-ad+bc)^2} \left(-1/8 \frac{bc(4ad^2e-bc^2f-3bcde)(bx+a)^{3/2}}{ad-bc} + 1/8 \frac{(4ad^2e+bc^2f-5bcde)bc\sqrt{bx+a}}{d} \right) \right) \right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x+e)*(b*x+a)^(1/2)/x/(d*x+c)^3,x)
```

```
[Out] 2*b^2*(-1/b^2/c^3*((-1/8*b*c*(4*a*d^2*e-b*c^2*f-3*b*c*d*e)/(a*d-b*c)*(b*x+a)^(3/2)+1/8*(4*a*d^2*e+b*c^2*f-5*b*c*d*e)*b*c/d*(b*x+a)^(1/2))/((b*x+a)*d-a*d+b*c)^2-1/8*(8*a^2*d^3*e-12*a*b*c*d^2*e+b^2*c^3*f+3*b^2*c^2*d*e)/(a*d-b*c)/d/((a*d-b*c)*d)^(1/2)*arctanh((b*x+a)^(1/2)*d/((a*d-b*c)*d)^(1/2))-a^(1/2)*e/b^2/c^3*arctanh((b*x+a)^(1/2)/a^(1/2)))
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)*(b*x+a)^(1/2)/x/(d*x+c)^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [B] time = 4.97522, size = 4551, normalized size = 22.2

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)*(b*x+a)^(1/2)/x/(d*x+c)^3,x, algorithm="fricas")
```

```
[Out] [1/8*((b^2*c^5*f + (b^2*c^3*d^2*f + (3*b^2*c^2*d^3 - 12*a*b*c*d^4 + 8*a^2*d^5)*e)*x^2 + (3*b^2*c^4*d - 12*a*b*c^3*d^2 + 8*a^2*c^2*d^3)*e + 2*(b^2*c^4*d*f + (3*b^2*c^3*d^2 - 12*a*b*c^2*d^3 + 8*a^2*c*d^4)*e)*x)*sqrt(-b*c*d + a*d^2)*log((b*d*x - b*c + 2*a*d + 2*sqrt(-b*c*d + a*d^2)*sqrt(b*x + a))/(d*x + c)) + 8*((b^2*c^2*d^4 - 2*a*b*c*d^5 + a^2*d^6)*e*x^2 + 2*(b^2*c^3*d^3 - 2*a*b*c^2*d^4 + a^2*c*d^5)*e*x + (b^2*c^4*d^2 - 2*a*b*c^3*d^3 + a^2*c^2*d^4)*e)*sqrt(a)*log((b*x - 2*sqrt(b*x + a)*sqrt(a) + 2*a)/x) + 2*((5*b^2*c^4*d^2 - 11*a*b*c^3*d^3 + 6*a^2*c^2*d^4)*e - (b^2*c^5*d - 3*a*b*c^4*d^2 + 2*a^2*c^3*d^3)*f + ((3*b^2*c^3*d^3 - 7*a*b*c^2*d^4 + 4*a^2*c*d^5)*e + (b^2*c^4*d^2 - a*b*c^3*d^3)*f)*x)*sqrt(b*x + a))/(b^2*c^7*d^2 - 2*a*b*c^6*d^3 + a^2*c^5*d^4 + (b^2*c^5*d^4 - 2*a*b*c^4*d^5 + a^2*c^3*d^6)*x^2 + 2*(b^2*c^6*d^3 -
```

$$\begin{aligned}
& 2*a*b*c^5*d^4 + a^2*c^4*d^5)*x), 1/8*(16*((b^2*c^2*d^4 - 2*a*b*c*d^5 + a^2*d^6)*e*x^2 + 2*(b^2*c^3*d^3 - 2*a*b*c^2*d^4 + a^2*c*d^5)*e*x + (b^2*c^4*d^2 - 2*a*b*c^3*d^3 + a^2*c^2*d^4)*e)*sqrt(-a)*arctan(sqrt(b*x + a)*sqrt(-a)/a) + (b^2*c^5*f + (b^2*c^3*d^2*f + (3*b^2*c^2*d^3 - 12*a*b*c*d^4 + 8*a^2*d^5)*e)*x^2 + (3*b^2*c^4*d - 12*a*b*c^3*d^2 + 8*a^2*c^2*d^3)*e + 2*(b^2*c^4*d*f + (3*b^2*c^3*d^2 - 12*a*b*c^2*d^3 + 8*a^2*c*d^4)*e)*x)*sqrt(-b*c*d + a*d^2)*log((b*d*x - b*c + 2*a*d + 2*sqrt(-b*c*d + a*d^2)*sqrt(b*x + a))/(d*x + c)) + 2*((5*b^2*c^4*d^2 - 11*a*b*c^3*d^3 + 6*a^2*c^2*d^4)*e - (b^2*c^5*d - 3*a*b*c^4*d^2 + 2*a^2*c^3*d^3)*f + ((3*b^2*c^3*d^3 - 7*a*b*c^2*d^4 + 4*a^2*c*d^5)*e + (b^2*c^4*d^2 - a*b*c^3*d^3)*f)*x)*sqrt(b*x + a))/(b^2*c^7*d^2 - 2*a*b*c^6*d^3 + a^2*c^5*d^4 + (b^2*c^5*d^4 - 2*a*b*c^4*d^5 + a^2*c^3*d^6)*x^2 + 2*(b^2*c^6*d^3 - 2*a*b*c^5*d^4 + a^2*c^4*d^5)*x), -1/4*((b^2*c^5*f + (b^2*c^3*d^2*f + (3*b^2*c^2*d^3 - 12*a*b*c*d^4 + 8*a^2*d^5)*e)*x^2 + (3*b^2*c^4*d - 12*a*b*c^3*d^2 + 8*a^2*c^2*d^3)*e + 2*(b^2*c^4*d*f + (3*b^2*c^3*d^2 - 12*a*b*c^2*d^3 + 8*a^2*c*d^4)*e)*x)*sqrt(b*c*d - a*d^2)*arctan(sqrt(b*c*d - a*d^2)*sqrt(b*x + a)/(b*d*x + a*d)) - 4*((b^2*c^2*d^4 - 2*a*b*c*d^5 + a^2*d^6)*e*x^2 + 2*(b^2*c^3*d^3 - 2*a*b*c^2*d^4 + a^2*c*d^5)*e*x + (b^2*c^4*d^2 - 2*a*b*c^3*d^3 + a^2*c^2*d^4)*e)*sqrt(a)*log((b*x - 2*sqrt(b*x + a)*sqrt(a) + 2*a)/x) - ((5*b^2*c^4*d^2 - 11*a*b*c^3*d^3 + 6*a^2*c^2*d^4)*e - (b^2*c^5*d - 3*a*b*c^4*d^2 + 2*a^2*c^3*d^3)*f + ((3*b^2*c^3*d^3 - 7*a*b*c^2*d^4 + 4*a^2*c*d^5)*e + (b^2*c^4*d^2 - a*b*c^3*d^3)*f)*x)*sqrt(b*x + a))/(b^2*c^7*d^2 - 2*a*b*c^6*d^3 + a^2*c^5*d^4 + (b^2*c^5*d^4 - 2*a*b*c^4*d^5 + a^2*c^3*d^6)*x^2 + 2*(b^2*c^6*d^3 - 2*a*b*c^5*d^4 + a^2*c^4*d^5)*x), -1/4*((b^2*c^5*f + (b^2*c^3*d^2*f + (3*b^2*c^2*d^3 - 12*a*b*c*d^4 + 8*a^2*d^5)*e)*x^2 + (3*b^2*c^4*d - 12*a*b*c^3*d^2 + 8*a^2*c^2*d^3)*e + 2*(b^2*c^4*d*f + (3*b^2*c^3*d^2 - 12*a*b*c^2*d^3 + 8*a^2*c*d^4)*e)*x)*sqrt(b*c*d - a*d^2)*arctan(sqrt(b*c*d - a*d^2)*sqrt(b*x + a)/(b*d*x + a*d)) - 8*((b^2*c^2*d^4 - 2*a*b*c*d^5 + a^2*d^6)*e*x^2 + 2*(b^2*c^3*d^3 - 2*a*b*c^2*d^4 + a^2*c*d^5)*e*x + (b^2*c^4*d^2 - 2*a*b*c^3*d^3 + a^2*c^2*d^4)*e)*sqrt(-a)*arctan(sqrt(b*x + a)*sqrt(-a)/a) - ((5*b^2*c^4*d^2 - 11*a*b*c^3*d^3 + 6*a^2*c^2*d^4)*e - (b^2*c^5*d - 3*a*b*c^4*d^2 + 2*a^2*c^3*d^3)*f + ((3*b^2*c^3*d^3 - 7*a*b*c^2*d^4 + 4*a^2*c*d^5)*e + (b^2*c^4*d^2 - a*b*c^3*d^3)*f)*x)*sqrt(b*x + a))/(b^2*c^7*d^2 - 2*a*b*c^6*d^3 + a^2*c^5*d^4 + (b^2*c^5*d^4 - 2*a*b*c^4*d^5 + a^2*c^3*d^6)*x^2 + 2*(b^2*c^6*d^3 - 2*a*b*c^5*d^4 + a^2*c^4*d^5)*x)]
\end{aligned}$$

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((f*x+e)*(b*x+a)**(1/2)/x/(d*x+c)**3,x)

[Out] Timed out

Giac [A] time = 1.82932, size = 406, normalized size = 1.98

$$\frac{(b^2c^3f + 3b^2c^2de - 12abcd^2e + 8a^2d^3e) \arctan\left(\frac{\sqrt{bx+ad}}{\sqrt{bcd-ad^2}}\right) + 2a \arctan\left(\frac{\sqrt{bx+a}}{\sqrt{-a}}\right) e - \sqrt{bx+ab^3c^3f} - (bx+a)^{\frac{3}{2}}b^2c^2df -}{4(bc^4d - ac^3d^2)\sqrt{bcd - ad^2} + \sqrt{-ac^3}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((f*x+e)*(b*x+a)^(1/2)/x/(d*x+c)^3,x, algorithm="giac")

[Out] $\frac{1}{4}*(b^2*c^3*f + 3*b^2*c^2*d*e - 12*a*b*c*d^2*e + 8*a^2*d^3*e)*\arctan(\sqrt{(b*x + a)*d/\sqrt{b*c*d - a*d^2}})/((b*c^4*d - a*c^3*d^2)*\sqrt{b*c*d - a*d^2}) + 2*a*\arctan(\sqrt{b*x + a}/\sqrt{-a})*e/(\sqrt{-a}*c^3) - \frac{1}{4}*(\sqrt{b*x + a}*b^3*c^3*f - (b*x + a)^{(3/2)}*b^2*c^2*d*f - \sqrt{b*x + a}*a*b^2*c^2*d*f - 5*\sqrt{b*x + a}*b^3*c^2*d*e - 3*(b*x + a)^{(3/2)}*b^2*c*d^2*e + 9*\sqrt{b*x + a}*a*b^2*c*d^2*e + 4*(b*x + a)^{(3/2)}*a*b*d^3*e - 4*\sqrt{b*x + a}*a^2*b*d^3*e)/((b*c^3*d - a*c^2*d^2)*(b*c + (b*x + a)*d - a*d)^2)$

$$3.22 \quad \int \frac{x^3(1+ax)}{\sqrt{ax}\sqrt{1-ax}} dx$$

Optimal. Leaf size=111

$$-\frac{\sqrt{1-ax}(ax)^{7/2}}{4a^4} - \frac{5\sqrt{1-ax}(ax)^{5/2}}{8a^4} - \frac{25\sqrt{1-ax}(ax)^{3/2}}{32a^4} - \frac{75\sqrt{1-ax}\sqrt{ax}}{64a^4} - \frac{75\sin^{-1}(1-2ax)}{128a^4}$$

[Out] $(-75*\text{Sqrt}[a*x]*\text{Sqrt}[1 - a*x])/(64*a^4) - (25*(a*x)^{(3/2)}*\text{Sqrt}[1 - a*x])/(32*a^4) - (5*(a*x)^{(5/2)}*\text{Sqrt}[1 - a*x])/(8*a^4) - ((a*x)^{(7/2)}*\text{Sqrt}[1 - a*x])/(4*a^4) - (75*\text{ArcSin}[1 - 2*a*x])/(128*a^4)$

Rubi [A] time = 0.0448675, antiderivative size = 111, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 6, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}} = 0.231$, Rules used = {16, 80, 50, 53, 619, 216}

$$-\frac{\sqrt{1-ax}(ax)^{7/2}}{4a^4} - \frac{5\sqrt{1-ax}(ax)^{5/2}}{8a^4} - \frac{25\sqrt{1-ax}(ax)^{3/2}}{32a^4} - \frac{75\sqrt{1-ax}\sqrt{ax}}{64a^4} - \frac{75\sin^{-1}(1-2ax)}{128a^4}$$

Antiderivative was successfully verified.

[In] $\text{Int}[(x^3*(1 + a*x))/(\text{Sqrt}[a*x]*\text{Sqrt}[1 - a*x]), x]$

[Out] $(-75*\text{Sqrt}[a*x]*\text{Sqrt}[1 - a*x])/(64*a^4) - (25*(a*x)^{(3/2)}*\text{Sqrt}[1 - a*x])/(32*a^4) - (5*(a*x)^{(5/2)}*\text{Sqrt}[1 - a*x])/(8*a^4) - ((a*x)^{(7/2)}*\text{Sqrt}[1 - a*x])/(4*a^4) - (75*\text{ArcSin}[1 - 2*a*x])/(128*a^4)$

Rule 16

$\text{Int}[(u_*)*(v_)^{(m_*)}*((b_)*(v_))^{(n_*)}, x_Symbol] \rightarrow \text{Dist}[1/b^m, \text{Int}[u*(b*v)^{(m+n)}, x], x] /; \text{FreeQ}\{b, n\}, x \ \&\& \ \text{IntegerQ}[m]$

Rule 80

$\text{Int}[(a_*) + (b_*)*(x_*)^{(n_*)}*((c_*) + (d_*)*(x_*)^{(p_*)})^{(q_*)}*((e_*) + (f_*)*(x_*)^{(r_*)})^{(s_*)}, x_Symbol] \rightarrow \text{Simp}[(b*(c + d*x)^{(n+1)}*(e + f*x)^{(p+1)})/(d*f*(n+p+2)), x] + \text{Dist}[(a*d*f*(n+p+2) - b*(d*e*(n+1) + c*f*(p+1)))/(d*f*(n+p+2)), \text{Int}[(c + d*x)^n*(e + f*x)^p, x], x] /; \text{FreeQ}\{a, b, c, d, e, f, n, p\}, x \ \&\& \ \text{NeQ}[n + p + 2, 0]$

Rule 50

```
Int[((a_.) + (b_.)*(x_)^(m_))*((c_.) + (d_.)*(x_)^(n_)), x_Symbol] := Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + n + 1)), x] + Dist[(n*(b*c - a*d))/
(b*(m + n + 1)), Int[(a + b*x)^m*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b,
c, d}, x] && NeQ[b*c - a*d, 0] && GtQ[n, 0] && NeQ[m + n + 1, 0] && !(IGtQ
[m, 0] && (!IntegerQ[n] || (GtQ[m, 0] && LtQ[m - n, 0]))) && !ILtQ[m + n
+ 2, 0] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 53

```
Int[1/(Sqrt[(a_) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]), x_Symbol] := Int[
1/Sqrt[a*c - b*(a - c)*x - b^2*x^2], x] /; FreeQ[{a, b, c, d}, x] && EqQ[b
+ d, 0] && GtQ[a + c, 0]
```

Rule 619

```
Int[((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_), x_Symbol] := Dist[1/(2*c*((-4
*c)/(b^2 - 4*a*c))^p), Subst[Int[Simp[1 - x^2/(b^2 - 4*a*c), x]^p, x], x, b
+ 2*c*x], x] /; FreeQ[{a, b, c, p}, x] && GtQ[4*a - b^2/c, 0]
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] := Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rubi steps

$$\begin{aligned}
\int \frac{x^3(1+ax)}{\sqrt{ax}\sqrt{1-ax}} dx &= \frac{\int \frac{(ax)^{5/2}(1+ax)}{\sqrt{1-ax}} dx}{a^3} \\
&= -\frac{(ax)^{7/2}\sqrt{1-ax}}{4a^4} + \frac{15 \int \frac{(ax)^{5/2}}{\sqrt{1-ax}} dx}{8a^3} \\
&= -\frac{5(ax)^{5/2}\sqrt{1-ax}}{8a^4} - \frac{(ax)^{7/2}\sqrt{1-ax}}{4a^4} + \frac{25 \int \frac{(ax)^{3/2}}{\sqrt{1-ax}} dx}{16a^3} \\
&= -\frac{25(ax)^{3/2}\sqrt{1-ax}}{32a^4} - \frac{5(ax)^{5/2}\sqrt{1-ax}}{8a^4} - \frac{(ax)^{7/2}\sqrt{1-ax}}{4a^4} + \frac{75 \int \frac{\sqrt{ax}}{\sqrt{1-ax}} dx}{64a^3} \\
&= -\frac{75\sqrt{ax}\sqrt{1-ax}}{64a^4} - \frac{25(ax)^{3/2}\sqrt{1-ax}}{32a^4} - \frac{5(ax)^{5/2}\sqrt{1-ax}}{8a^4} - \frac{(ax)^{7/2}\sqrt{1-ax}}{4a^4} + \frac{75 \int \frac{1}{\sqrt{ax}\sqrt{1-ax}} dx}{128a^3} \\
&= -\frac{75\sqrt{ax}\sqrt{1-ax}}{64a^4} - \frac{25(ax)^{3/2}\sqrt{1-ax}}{32a^4} - \frac{5(ax)^{5/2}\sqrt{1-ax}}{8a^4} - \frac{(ax)^{7/2}\sqrt{1-ax}}{4a^4} + \frac{75 \int \frac{1}{\sqrt{ax-a^2x^2}} dx}{128a^3} \\
&= -\frac{75\sqrt{ax}\sqrt{1-ax}}{64a^4} - \frac{25(ax)^{3/2}\sqrt{1-ax}}{32a^4} - \frac{5(ax)^{5/2}\sqrt{1-ax}}{8a^4} - \frac{(ax)^{7/2}\sqrt{1-ax}}{4a^4} - \frac{75 \operatorname{Subst} \left(\int \frac{1}{\sqrt{1-\frac{x^2}{a^2}}} dx \right)}{128a^5} \\
&= -\frac{75\sqrt{ax}\sqrt{1-ax}}{64a^4} - \frac{25(ax)^{3/2}\sqrt{1-ax}}{32a^4} - \frac{5(ax)^{5/2}\sqrt{1-ax}}{8a^4} - \frac{(ax)^{7/2}\sqrt{1-ax}}{4a^4} - \frac{75 \sin^{-1}(1-2ax)}{128a^4}
\end{aligned}$$

Mathematica [A] time = 0.0846198, size = 89, normalized size = 0.8

$$\frac{\sqrt{ax} (16a^4x^4 + 24a^3x^3 + 10a^2x^2 + 25ax - 75) + 75\sqrt{x}\sqrt{1-ax} \sin^{-1}(\sqrt{a}\sqrt{x})}{64a^{7/2}\sqrt{-ax(ax-1)}}$$

Antiderivative was successfully verified.

[In] Integrate[(x^3*(1 + a*x))/(Sqrt[a*x]*Sqrt[1 - a*x]),x]

[Out] (Sqrt[a]*x*(-75 + 25*a*x + 10*a^2*x^2 + 24*a^3*x^3 + 16*a^4*x^4) + 75*Sqrt[x]*Sqrt[1 - a*x]*ArcSin[Sqrt[a]*Sqrt[x]])/(64*a^(7/2)*Sqrt[-(a*x*(-1 + a*x))])

Maple [C] time = 0.03, size = 132, normalized size = 1.2

$$-\frac{x \operatorname{csgn}(a)}{128a^3} \sqrt{-ax+1} \left(32 \operatorname{csgn}(a) x^3 a^3 \sqrt{-x(ax-1)} a + 80 a^2 x^2 \sqrt{-x(ax-1)} a \operatorname{csgn}(a) + 100 \sqrt{-x(ax-1)} a \operatorname{csgn}(a) x a \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] $\text{int}(x^3*(a*x+1)/(a*x)^{(1/2)/(-a*x+1)^{(1/2)},x)$

[Out] $-1/128*(-a*x+1)^{(1/2)*x*(32*csgn(a)*x^3*a^3*(-x*(a*x-1)*a)^{(1/2)+80*a^2*x^2*(-x*(a*x-1)*a)^{(1/2)*csgn(a)+100*(-x*(a*x-1)*a)^{(1/2)*csgn(a)*x*a+150*(-x*(a*x-1)*a)^{(1/2)*csgn(a)-75*\arctan(1/2*csgn(a)*(2*a*x-1)/(-x*(a*x-1)*a)^{(1/2)))*csgn(a)/a^3/(a*x)^{(1/2)/(-x*(a*x-1)*a)^{(1/2)}$

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

[In] $\text{integrate}(x^3*(a*x+1)/(a*x)^{(1/2)/(-a*x+1)^{(1/2)},x, \text{algorithm}="maxima")$

[Out] Exception raised: ValueError

Fricas [A] time = 1.26349, size = 165, normalized size = 1.49

$$\frac{(16a^3x^3 + 40a^2x^2 + 50ax + 75)\sqrt{ax}\sqrt{-ax+1} + 75 \arctan\left(\frac{\sqrt{ax}\sqrt{-ax+1}}{ax}\right)}{64a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] $\text{integrate}(x^3*(a*x+1)/(a*x)^{(1/2)/(-a*x+1)^{(1/2)},x, \text{algorithm}="fricas")$

[Out] $-1/64*((16*a^3*x^3 + 40*a^2*x^2 + 50*a*x + 75)*\text{sqrt}(a*x)*\text{sqrt}(-a*x + 1) + 75*\arctan(\text{sqrt}(a*x)*\text{sqrt}(-a*x + 1)/(a*x)))/a^4$

Sympy [C] time = 25.7371, size = 484, normalized size = 4.36

$$a \left(\begin{array}{l} \left(\begin{array}{l} -\frac{35i \operatorname{acosh}(\sqrt{a}\sqrt{x})}{64a^5} - \frac{ix^{\frac{9}{2}}}{4\sqrt{a}\sqrt{ax-1}} - \frac{ix^{\frac{7}{2}}}{24a^2\sqrt{ax-1}} - \frac{7ix^{\frac{5}{2}}}{96a^2\sqrt{ax-1}} - \frac{35ix^{\frac{3}{2}}}{192a^2\sqrt{ax-1}} + \frac{35i\sqrt{x}}{64a^2\sqrt{ax-1}} \\ \frac{35 \operatorname{asin}(\sqrt{a}\sqrt{x})}{64a^5} + \frac{x^{\frac{9}{2}}}{4\sqrt{a}\sqrt{-ax+1}} + \frac{x^{\frac{7}{2}}}{24a^2\sqrt{-ax+1}} + \frac{7x^{\frac{5}{2}}}{96a^2\sqrt{-ax+1}} + \frac{35x^{\frac{3}{2}}}{192a^2\sqrt{-ax+1}} - \frac{35\sqrt{x}}{64a^2\sqrt{-ax+1}} \end{array} \right) \begin{array}{l} \text{for } |ax| > 1 \\ \text{otherwise} \end{array} \end{array} \right) + \left(\begin{array}{l} -\frac{5i \operatorname{acosh}(\sqrt{a}\sqrt{x})}{8a^4} \\ \frac{5 \operatorname{asin}(\sqrt{a}\sqrt{x})}{8a^4} + \frac{3}{3} \end{array} \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x**3*(a*x+1)/(a*x)**(1/2)/(-a*x+1)**(1/2),x)

[Out] a*Piecewise((-35*I*acosh(sqrt(a)*sqrt(x))/(64*a**5) - I*x**(9/2)/(4*sqrt(a)*sqrt(a*x - 1)) - I*x**(7/2)/(24*a**(3/2)*sqrt(a*x - 1)) - 7*I*x**(5/2)/(96*a**(5/2)*sqrt(a*x - 1)) - 35*I*x**(3/2)/(192*a**(7/2)*sqrt(a*x - 1)) + 35*I*sqrt(x)/(64*a**(9/2)*sqrt(a*x - 1)), Abs(a*x) > 1), (35*asin(sqrt(a)*sqrt(x))/(64*a**5) + x**(9/2)/(4*sqrt(a)*sqrt(-a*x + 1)) + x**(7/2)/(24*a**(3/2)*sqrt(-a*x + 1)) + 7*x**(5/2)/(96*a**(5/2)*sqrt(-a*x + 1)) + 35*x**(3/2)/(192*a**(7/2)*sqrt(-a*x + 1)) - 35*sqrt(x)/(64*a**(9/2)*sqrt(-a*x + 1)), True)) + Piecewise((-5*I*acosh(sqrt(a)*sqrt(x))/(8*a**4) - I*x**(7/2)/(3*sqrt(a)*sqrt(a*x - 1)) - I*x**(5/2)/(12*a**(3/2)*sqrt(a*x - 1)) - 5*I*x**(3/2)/(24*a**(5/2)*sqrt(a*x - 1)) + 5*I*sqrt(x)/(8*a**(7/2)*sqrt(a*x - 1)), Abs(a*x) > 1), (5*asin(sqrt(a)*sqrt(x))/(8*a**4) + x**(7/2)/(3*sqrt(a)*sqrt(-a*x + 1)) + x**(5/2)/(12*a**(3/2)*sqrt(-a*x + 1)) + 5*x**(3/2)/(24*a**(5/2)*sqrt(-a*x + 1)) - 5*sqrt(x)/(8*a**(7/2)*sqrt(-a*x + 1)), True))

Giac [A] time = 1.77946, size = 85, normalized size = 0.77

$$\frac{\left(2\left(4ax\left(\frac{2x}{a^2} + \frac{5}{a^3}\right) + \frac{25}{a^3}\right)ax + \frac{75}{a^3}\right)\sqrt{ax}\sqrt{-ax+1} - \frac{75\arcsin(\sqrt{ax})}{a^3}}{64a}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^3*(a*x+1)/(a*x)^(1/2)/(-a*x+1)^(1/2),x, algorithm="giac")

[Out] -1/64*((2*(4*a*x*(2*x/a^2 + 5/a^3) + 25/a^3)*a*x + 75/a^3)*sqrt(a*x)*sqrt(-a*x + 1) - 75*arcsin(sqrt(a*x))/a^3)/a

3.23

$$\int \frac{x^2(1+ax)}{\sqrt{ax}\sqrt{1-ax}} dx$$

Optimal. Leaf size=87

$$-\frac{\sqrt{1-ax}(ax)^{5/2}}{3a^3} - \frac{11\sqrt{1-ax}(ax)^{3/2}}{12a^3} - \frac{11\sqrt{1-ax}\sqrt{ax}}{8a^3} - \frac{11\sin^{-1}(1-2ax)}{16a^3}$$

[Out] (-11*Sqrt[a*x]*Sqrt[1 - a*x])/(8*a^3) - (11*(a*x)^(3/2)*Sqrt[1 - a*x])/(12*a^3) - ((a*x)^(5/2)*Sqrt[1 - a*x])/(3*a^3) - (11*ArcSin[1 - 2*a*x])/(16*a^3)

Rubi [A] time = 0.0335764, antiderivative size = 87, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 6, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}} = 0.231$, Rules used = {16, 80, 50, 53, 619, 216}

$$-\frac{\sqrt{1-ax}(ax)^{5/2}}{3a^3} - \frac{11\sqrt{1-ax}(ax)^{3/2}}{12a^3} - \frac{11\sqrt{1-ax}\sqrt{ax}}{8a^3} - \frac{11\sin^{-1}(1-2ax)}{16a^3}$$

Antiderivative was successfully verified.

[In] Int[(x^2*(1 + a*x))/(Sqrt[a*x]*Sqrt[1 - a*x]),x]

[Out] (-11*Sqrt[a*x]*Sqrt[1 - a*x])/(8*a^3) - (11*(a*x)^(3/2)*Sqrt[1 - a*x])/(12*a^3) - ((a*x)^(5/2)*Sqrt[1 - a*x])/(3*a^3) - (11*ArcSin[1 - 2*a*x])/(16*a^3)

Rule 16

Int[(u_.)*(v_)^(m_.)*((b_.)*(v_))^(n_), x_Symbol] := Dist[1/b^m, Int[u*(b*v)^(m + n), x], x] /; FreeQ[{b, n}, x] && IntegerQ[m]

Rule 80

Int[((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p_.), x_Symbol] := Simp[(b*(c + d*x)^(n + 1)*(e + f*x)^(p + 1))/(d*f*(n + p + 2)), x] + Dist[(a*d*f*(n + p + 2) - b*(d*e*(n + 1) + c*f*(p + 1)))/(d*f*(n + p + 2)), Int[(c + d*x)^n*(e + f*x)^p, x], x] /; FreeQ[{a, b, c, d, e, f, n, p}, x] && NeQ[n + p + 2, 0]

Rule 50

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] := Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + n + 1)), x] + Dist[(n*(b*c - a*d))/
(b*(m + n + 1)), Int[(a + b*x)^m*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b,
c, d}, x] && NeQ[b*c - a*d, 0] && GtQ[n, 0] && NeQ[m + n + 1, 0] && !(IGtQ[
m, 0] && (!IntegerQ[n] || (GtQ[m, 0] && LtQ[m - n, 0]))) && !ILtQ[m + n
+ 2, 0] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 53

```
Int[1/(Sqrt[(a_) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]), x_Symbol] := Int[
1/Sqrt[a*c - b*(a - c)*x - b^2*x^2], x] /; FreeQ[{a, b, c, d}, x] && EqQ[b
+ d, 0] && GtQ[a + c, 0]
```

Rule 619

```
Int[((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_), x_Symbol] := Dist[1/(2*c*((-4
*c)/(b^2 - 4*a*c))^p), Subst[Int[Simp[1 - x^2/(b^2 - 4*a*c), x]^p, x], x, b
+ 2*c*x], x] /; FreeQ[{a, b, c, p}, x] && GtQ[4*a - b^2/c, 0]
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] := Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rubi steps

$$\begin{aligned}
\int \frac{x^2(1+ax)}{\sqrt{ax}\sqrt{1-ax}} dx &= \frac{\int \frac{(ax)^{3/2}(1+ax)}{\sqrt{1-ax}} dx}{a^2} \\
&= -\frac{(ax)^{5/2}\sqrt{1-ax}}{3a^3} + \frac{11 \int \frac{(ax)^{3/2}}{\sqrt{1-ax}} dx}{6a^2} \\
&= -\frac{11(ax)^{3/2}\sqrt{1-ax}}{12a^3} - \frac{(ax)^{5/2}\sqrt{1-ax}}{3a^3} + \frac{11 \int \frac{\sqrt{ax}}{\sqrt{1-ax}} dx}{8a^2} \\
&= -\frac{11\sqrt{ax}\sqrt{1-ax}}{8a^3} - \frac{11(ax)^{3/2}\sqrt{1-ax}}{12a^3} - \frac{(ax)^{5/2}\sqrt{1-ax}}{3a^3} + \frac{11 \int \frac{1}{\sqrt{ax}\sqrt{1-ax}} dx}{16a^2} \\
&= -\frac{11\sqrt{ax}\sqrt{1-ax}}{8a^3} - \frac{11(ax)^{3/2}\sqrt{1-ax}}{12a^3} - \frac{(ax)^{5/2}\sqrt{1-ax}}{3a^3} + \frac{11 \int \frac{1}{\sqrt{ax-a^2x^2}} dx}{16a^2} \\
&= -\frac{11\sqrt{ax}\sqrt{1-ax}}{8a^3} - \frac{11(ax)^{3/2}\sqrt{1-ax}}{12a^3} - \frac{(ax)^{5/2}\sqrt{1-ax}}{3a^3} - \frac{11 \operatorname{Subst} \left(\int \frac{1}{\sqrt{1-\frac{x^2}{a^2}}} dx, x, a-2a^2x \right)}{16a^4} \\
&= -\frac{11\sqrt{ax}\sqrt{1-ax}}{8a^3} - \frac{11(ax)^{3/2}\sqrt{1-ax}}{12a^3} - \frac{(ax)^{5/2}\sqrt{1-ax}}{3a^3} - \frac{11 \sin^{-1}(1-2ax)}{16a^3}
\end{aligned}$$

Mathematica [A] time = 0.0311233, size = 81, normalized size = 0.93

$$\frac{\sqrt{ax} \left(8a^3x^3 + 14a^2x^2 + 11ax - 33 \right) + 33\sqrt{x}\sqrt{1-ax} \sin^{-1} \left(\sqrt{a}\sqrt{x} \right)}{24a^{5/2}\sqrt{-ax(ax-1)}}$$

Antiderivative was successfully verified.

[In] Integrate[(x^2*(1 + a*x))/(Sqrt[a*x]*Sqrt[1 - a*x]),x]

[Out] (Sqrt[a]*x*(-33 + 11*a*x + 14*a^2*x^2 + 8*a^3*x^3) + 33*Sqrt[x]*Sqrt[1 - a*x]*ArcSin[Sqrt[a]*Sqrt[x]])/(24*a^(5/2)*Sqrt[-(a*x*(-1 + a*x))])

Maple [C] time = 0.013, size = 111, normalized size = 1.3

$$\frac{x \operatorname{csgn}(a)}{48a^2} \sqrt{-ax+1} \left(-16a^2x^2\sqrt{-x(ax-1)} \operatorname{acsgn}(a) - 44\sqrt{-x(ax-1)} \operatorname{acsgn}(a)xa - 66\sqrt{-x(ax-1)} \operatorname{acsgn}(a) + 33 \operatorname{arcsin} \left(\frac{\sqrt{ax}}{\sqrt{1-ax}} \right) \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `int(x^2*(a*x+1)/(a*x)^(1/2)/(-a*x+1)^(1/2),x)`

[Out] $\frac{1}{48}(-a*x+1)^{(1/2)}*x*(-16*a^2*x^2*(-x*(a*x-1)*a)^{(1/2)}*csgn(a)-44*(-x*(a*x-1)*a)^{(1/2)}*csgn(a)*x*a-66*(-x*(a*x-1)*a)^{(1/2)}*csgn(a)+33*\arctan(1/2*csgn(a)*(2*a*x-1)/(-x*(a*x-1)*a)^{(1/2)})$
 $*csgn(a)/a^2/(a*x)^{(1/2)/(-x*(a*x-1)*a)^{(1/2)}$

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate(x^2*(a*x+1)/(a*x)^(1/2)/(-a*x+1)^(1/2),x, algorithm="maxima")`

[Out] Exception raised: ValueError

Fricas [A] time = 1.37876, size = 146, normalized size = 1.68

$$\frac{(8a^2x^2 + 22ax + 33)\sqrt{ax}\sqrt{-ax+1} + 33 \arctan\left(\frac{\sqrt{ax}\sqrt{-ax+1}}{ax}\right)}{24a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate(x^2*(a*x+1)/(a*x)^(1/2)/(-a*x+1)^(1/2),x, algorithm="fricas")`

[Out] $-1/24*((8*a^2*x^2 + 22*a*x + 33)*\sqrt{a*x}*\sqrt{-a*x + 1} + 33*\arctan(\sqrt{a*x}*\sqrt{-a*x + 1}/(a*x)))/a^3$

Sympy [C] time = 18.821, size = 393, normalized size = 4.52

$$a \left(\begin{array}{l} \left(\frac{5i \operatorname{acosh}(\sqrt{a}\sqrt{x})}{8a^4} - \frac{ix^{\frac{7}{2}}}{3\sqrt{a}\sqrt{ax-1}} - \frac{ix^{\frac{5}{2}}}{12a^{\frac{3}{2}}\sqrt{ax-1}} - \frac{5ix^{\frac{3}{2}}}{24a^{\frac{5}{2}}\sqrt{ax-1}} + \frac{5i\sqrt{x}}{8a^{\frac{7}{2}}\sqrt{ax-1}} \right. \\ \left. \frac{5 \operatorname{asin}(\sqrt{a}\sqrt{x})}{8a^4} + \frac{x^{\frac{7}{2}}}{3\sqrt{a}\sqrt{-ax+1}} + \frac{x^{\frac{5}{2}}}{12a^{\frac{3}{2}}\sqrt{-ax+1}} + \frac{5x^{\frac{3}{2}}}{24a^{\frac{5}{2}}\sqrt{-ax+1}} - \frac{5\sqrt{x}}{8a^{\frac{7}{2}}\sqrt{-ax+1}} \right) \end{array} \right) \begin{array}{l} \text{for } |ax| > 1 \\ \text{otherwise} \end{array} + \left(\begin{array}{l} \frac{3i \operatorname{acosh}(\sqrt{a}\sqrt{x})}{4a^3} - \frac{ix^{\frac{5}{2}}}{2\sqrt{a}\sqrt{ax-1}} - \frac{ix^{\frac{3}{2}}}{4a^{\frac{5}{2}}\sqrt{ax-1}} \\ \frac{3 \operatorname{asin}(\sqrt{a}\sqrt{x})}{4a^3} + \frac{x^{\frac{5}{2}}}{2\sqrt{a}\sqrt{-ax+1}} + \frac{x^{\frac{3}{2}}}{4a^{\frac{5}{2}}\sqrt{-ax+1}} \end{array} \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x**2*(a*x+1)/(a*x)**(1/2)/(-a*x+1)**(1/2),x)

[Out] a*Piecewise((-5*I*acosh(sqrt(a)*sqrt(x))/(8*a**4) - I*x**(7/2)/(3*sqrt(a)*sqrt(a*x - 1)) - I*x**(5/2)/(12*a**(3/2)*sqrt(a*x - 1)) - 5*I*x**(3/2)/(24*a**(5/2)*sqrt(a*x - 1)) + 5*I*sqrt(x)/(8*a**(7/2)*sqrt(a*x - 1)), Abs(a*x) > 1), (5*asin(sqrt(a)*sqrt(x))/(8*a**4) + x**(7/2)/(3*sqrt(a)*sqrt(-a*x + 1)) + x**(5/2)/(12*a**(3/2)*sqrt(-a*x + 1)) + 5*x**(3/2)/(24*a**(5/2)*sqrt(-a*x + 1)) - 5*sqrt(x)/(8*a**(7/2)*sqrt(-a*x + 1)), True)) + Piecewise((-3*I*acosh(sqrt(a)*sqrt(x))/(4*a**3) - I*x**(5/2)/(2*sqrt(a)*sqrt(a*x - 1)) - I*x**(3/2)/(4*a**(3/2)*sqrt(a*x - 1)) + 3*I*sqrt(x)/(4*a**(5/2)*sqrt(a*x - 1)), Abs(a*x) > 1), (3*asin(sqrt(a)*sqrt(x))/(4*a**3) + x**(5/2)/(2*sqrt(a)*sqrt(-a*x + 1)) + x**(3/2)/(4*a**(3/2)*sqrt(-a*x + 1)) - 3*sqrt(x)/(4*a**(5/2)*sqrt(-a*x + 1)), True))

Giac [A] time = 2.58971, size = 72, normalized size = 0.83

$$\frac{\left(2ax\left(\frac{4x}{a} + \frac{11}{a^2}\right) + \frac{33}{a^2}\right)\sqrt{ax}\sqrt{-ax+1} - \frac{33\arcsin(\sqrt{ax})}{a^2}}{24a}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^2*(a*x+1)/(a*x)^(1/2)/(-a*x+1)^(1/2),x, algorithm="giac")

[Out] -1/24*((2*a*x*(4*x/a + 11/a^2) + 33/a^2)*sqrt(a*x)*sqrt(-a*x + 1) - 33*arcsin(sqrt(a*x)))/a^2/a

$$3.24 \quad \int \frac{x(1+ax)}{\sqrt{ax}\sqrt{1-ax}} dx$$

Optimal. Leaf size=63

$$-\frac{\sqrt{1-ax}(ax)^{3/2}}{2a^2} - \frac{7\sqrt{1-ax}\sqrt{ax}}{4a^2} - \frac{7\sin^{-1}(1-2ax)}{8a^2}$$

[Out] $(-7*\text{Sqrt}[a*x]*\text{Sqrt}[1 - a*x])/(4*a^2) - ((a*x)^{(3/2)}*\text{Sqrt}[1 - a*x])/(2*a^2) - (7*\text{ArcSin}[1 - 2*a*x])/(8*a^2)$

Rubi [A] time = 0.0232313, antiderivative size = 63, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.25$, Rules used = {16, 80, 50, 53, 619, 216}

$$-\frac{\sqrt{1-ax}(ax)^{3/2}}{2a^2} - \frac{7\sqrt{1-ax}\sqrt{ax}}{4a^2} - \frac{7\sin^{-1}(1-2ax)}{8a^2}$$

Antiderivative was successfully verified.

[In] $\text{Int}[(x*(1 + a*x))/(\text{Sqrt}[a*x]*\text{Sqrt}[1 - a*x]), x]$

[Out] $(-7*\text{Sqrt}[a*x]*\text{Sqrt}[1 - a*x])/(4*a^2) - ((a*x)^{(3/2)}*\text{Sqrt}[1 - a*x])/(2*a^2) - (7*\text{ArcSin}[1 - 2*a*x])/(8*a^2)$

Rule 16

$\text{Int}[(u_.)*(v_)^{(m_.)*((b_.)*(v_))^{(n_.)}, x_Symbol] := \text{Dist}[1/b^m, \text{Int}[u*(b*v)^{(m+n)}, x], x] /; \text{FreeQ}[\{b, n\}, x] \ \&\& \ \text{IntegerQ}[m]$

Rule 80

$\text{Int}[(a_. + (b_.)*(x_))*((c_.) + (d_.)*(x_))^{(n_.)*((e_.) + (f_.)*(x_))^{(p_.)}, x_Symbol] := \text{Simp}[(b*(c + d*x)^{(n+1)}*(e + f*x)^{(p+1)})/(d*f*(n+p+2)), x] + \text{Dist}[(a*d*f*(n+p+2) - b*(d*e*(n+1) + c*f*(p+1)))/(d*f*(n+p+2)), \text{Int}[(c + d*x)^n*(e + f*x)^p, x], x] /; \text{FreeQ}[\{a, b, c, d, e, f, n, p\}, x] \ \&\& \ \text{NeQ}[n+p+2, 0]$

Rule 50

$\text{Int}[(a_. + (b_.)*(x_))^{(m_.)*((c_.) + (d_.)*(x_))^{(n_.)}, x_Symbol] := \text{Simp}[(a + b*x)^{(m+1)}*(c + d*x)^n/(b*(m+n+1)), x] + \text{Dist}[(n*(b*c - a*d))/$

```
(b*(m + n + 1)), Int[(a + b*x)^m*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0] && GtQ[n, 0] && NeQ[m + n + 1, 0] && !(IGtQ[m, 0] && (!IntegerQ[n] || (GtQ[m, 0] && LtQ[m - n, 0]))) && !ILtQ[m + n + 2, 0] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 53

```
Int[1/(Sqrt[(a_) + (b_)*(x_)]*Sqrt[(c_) + (d_)*(x_)]), x_Symbol] := Int[1/Sqrt[a*c - b*(a - c)*x - b^2*x^2], x] /; FreeQ[{a, b, c, d}, x] && EqQ[b + d, 0] && GtQ[a + c, 0]
```

Rule 619

```
Int[((a_) + (b_)*(x_) + (c_)*(x_)^2)^(p_), x_Symbol] := Dist[1/(2*c*((-4*c)/(b^2 - 4*a*c))^p), Subst[Int[Simp[1 - x^2/(b^2 - 4*a*c), x]^p, x], x, b + 2*c*x], x] /; FreeQ[{a, b, c, p}, x] && GtQ[4*a - b^2/c, 0]
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_)*(x_)^2], x_Symbol] := Simp[ArcSin[(Rt[-b, 2]*x)/Sqrt[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rubi steps

$$\begin{aligned}
 \int \frac{x(1+ax)}{\sqrt{ax}\sqrt{1-ax}} dx &= \frac{\int \frac{\sqrt{ax}(1+ax)}{\sqrt{1-ax}} dx}{a} \\
 &= -\frac{(ax)^{3/2}\sqrt{1-ax}}{2a^2} + \frac{7 \int \frac{\sqrt{ax}}{\sqrt{1-ax}} dx}{4a} \\
 &= -\frac{7\sqrt{ax}\sqrt{1-ax}}{4a^2} - \frac{(ax)^{3/2}\sqrt{1-ax}}{2a^2} + \frac{7 \int \frac{1}{\sqrt{ax}\sqrt{1-ax}} dx}{8a} \\
 &= -\frac{7\sqrt{ax}\sqrt{1-ax}}{4a^2} - \frac{(ax)^{3/2}\sqrt{1-ax}}{2a^2} + \frac{7 \int \frac{1}{\sqrt{ax-a^2x^2}} dx}{8a} \\
 &= -\frac{7\sqrt{ax}\sqrt{1-ax}}{4a^2} - \frac{(ax)^{3/2}\sqrt{1-ax}}{2a^2} - \frac{7 \operatorname{Subst}\left(\int \frac{1}{\sqrt{1-\frac{x^2}{a^2}}} dx, x, a-2a^2x\right)}{8a^3} \\
 &= -\frac{7\sqrt{ax}\sqrt{1-ax}}{4a^2} - \frac{(ax)^{3/2}\sqrt{1-ax}}{2a^2} - \frac{7 \sin^{-1}(1-2ax)}{8a^2}
 \end{aligned}$$

Mathematica [A] time = 0.0267346, size = 73, normalized size = 1.16

$$\frac{\sqrt{ax}(2a^2x^2 + 5ax - 7) + 7\sqrt{x}\sqrt{1-ax}\sin^{-1}(\sqrt{a}\sqrt{x})}{4a^{3/2}\sqrt{-ax(ax-1)}}$$

Antiderivative was successfully verified.

[In] Integrate[(x*(1 + a*x))/(Sqrt[a*x]*Sqrt[1 - a*x]),x]

[Out] (Sqrt[a]*x*(-7 + 5*a*x + 2*a^2*x^2) + 7*Sqrt[x]*Sqrt[1 - a*x]*ArcSin[Sqrt[a]*Sqrt[x]])/(4*a^(3/2)*Sqrt[-(a*x*(-1 + a*x))])

Maple [C] time = 0.011, size = 90, normalized size = 1.4

$$-\frac{x\text{csgn}(a)}{8a}\sqrt{-ax+1}\left(4\sqrt{-x(ax-1)}\text{acsgn}(a)xa+14\sqrt{-x(ax-1)}\text{acsgn}(a)-7\arctan\left(\frac{1}{2}\frac{\text{csgn}(a)(2ax-1)}{\sqrt{-x(ax-1)}a}\right)\right)\frac{1}{\sqrt{a}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(x*(a*x+1)/(a*x)^(1/2)/(-a*x+1)^(1/2),x)

[Out] -1/8*(-a*x+1)^(1/2)*x/a*(4*(-x*(a*x-1)*a)^(1/2)*csgn(a)*x*a+14*(-x*(a*x-1)*a)^(1/2)*csgn(a)-7*arctan(1/2*csgn(a)*(2*a*x-1)/(-x*(a*x-1)*a)^(1/2))*csgn(a)/(a*x)^(1/2)/(-x*(a*x-1)*a)^(1/2)

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x*(a*x+1)/(a*x)^(1/2)/(-a*x+1)^(1/2),x, algorithm="maxima")

[Out] Exception raised: ValueError

Fricas [A] time = 1.31869, size = 124, normalized size = 1.97

$$\frac{(2ax + 7)\sqrt{ax}\sqrt{-ax + 1} + 7 \arctan\left(\frac{\sqrt{ax}\sqrt{-ax+1}}{ax}\right)}{4a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x*(a*x+1)/(a*x)^(1/2)/(-a*x+1)^(1/2),x, algorithm="fricas")

[Out] -1/4*((2*a*x + 7)*sqrt(a*x)*sqrt(-a*x + 1) + 7*arctan(sqrt(a*x)*sqrt(-a*x + 1)/(a*x)))/a^2

Sympy [C] time = 14.3845, size = 269, normalized size = 4.27

$$a \left(\begin{cases} \left(-\frac{3i \operatorname{acosh}(\sqrt{a}\sqrt{x})}{4a^3} - \frac{ix^{\frac{5}{2}}}{2\sqrt{a}\sqrt{ax-1}} - \frac{ix^{\frac{3}{2}}}{4a^2\sqrt{ax-1}} + \frac{3i\sqrt{x}}{4a^2\sqrt{ax-1}} \right) & \text{for } |ax| > 1 \\ \left(\frac{3 \operatorname{asin}(\sqrt{a}\sqrt{x})}{4a^3} + \frac{x^{\frac{5}{2}}}{2\sqrt{a}\sqrt{-ax+1}} + \frac{x^{\frac{3}{2}}}{4a^2\sqrt{-ax+1}} - \frac{3\sqrt{x}}{4a^2\sqrt{-ax+1}} \right) & \text{otherwise} \end{cases} \right) + \begin{cases} \left(-\frac{i \operatorname{acosh}(\sqrt{a}\sqrt{x})}{a^2} - \frac{i\sqrt{x}\sqrt{ax-1}}{a^{\frac{3}{2}}} \right) & \text{for } |ax| > 1 \\ \left(\frac{\operatorname{asin}(\sqrt{a}\sqrt{x})}{a^2} + \frac{x^{\frac{3}{2}}}{\sqrt{a}\sqrt{-ax+1}} - \frac{\sqrt{x}}{a^{\frac{3}{2}}\sqrt{-ax+1}} \right) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x*(a*x+1)/(a*x)**(1/2)/(-a*x+1)**(1/2),x)

[Out] a*Piecewise((-3*I*acosh(sqrt(a)*sqrt(x))/(4*a**3) - I*x**(5/2)/(2*sqrt(a)*sqrt(a*x - 1)) - I*x**(3/2)/(4*a**(3/2)*sqrt(a*x - 1)) + 3*I*sqrt(x)/(4*a**(5/2)*sqrt(a*x - 1)), Abs(a*x) > 1), (3*asin(sqrt(a)*sqrt(x))/(4*a**3) + x**(5/2)/(2*sqrt(a)*sqrt(-a*x + 1)) + x**(3/2)/(4*a**(3/2)*sqrt(-a*x + 1)) - 3*sqrt(x)/(4*a**(5/2)*sqrt(-a*x + 1)), True)) + Piecewise((-I*acosh(sqrt(a)*sqrt(x))/a**2 - I*sqrt(x)*sqrt(a*x - 1)/a**(3/2), Abs(a*x) > 1), (asin(sqrt(a)*sqrt(x))/a**2 + x**(3/2)/(sqrt(a)*sqrt(-a*x + 1)) - sqrt(x)/(a**(3/2)*sqrt(-a*x + 1)), True))

Giac [A] time = 2.49052, size = 54, normalized size = 0.86

$$\frac{\sqrt{ax}\sqrt{-ax+1}\left(2x + \frac{7}{a}\right) - \frac{7 \arcsin(\sqrt{ax})}{a}}{4a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a*x+1)/(a*x)^(1/2)/(-a*x+1)^(1/2),x, algorithm="giac")
```

```
[Out] -1/4*(sqrt(a*x)*sqrt(-a*x + 1)*(2*x + 7/a) - 7*arcsin(sqrt(a*x))/a)/a
```

$$3.25 \quad \int \frac{1+ax}{\sqrt{ax}\sqrt{1-ax}} dx$$

Optimal. Leaf size=37

$$-\frac{\sqrt{ax}\sqrt{1-ax}}{a} - \frac{3 \sin^{-1}(1-2ax)}{2a}$$

[Out] -((Sqrt[a*x]*Sqrt[1 - a*x])/a) - (3*ArcSin[1 - 2*a*x])/(2*a)

Rubi [A] time = 0.0125165, antiderivative size = 37, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.174$, Rules used = {80, 53, 619, 216}

$$-\frac{\sqrt{ax}\sqrt{1-ax}}{a} - \frac{3 \sin^{-1}(1-2ax)}{2a}$$

Antiderivative was successfully verified.

[In] Int[(1 + a*x)/(Sqrt[a*x]*Sqrt[1 - a*x]),x]

[Out] -((Sqrt[a*x]*Sqrt[1 - a*x])/a) - (3*ArcSin[1 - 2*a*x])/(2*a)

Rule 80

Int[((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p_.), x_Symbol] :> Simp[(b*(c + d*x)^(n + 1)*(e + f*x)^(p + 1))/(d*f*(n + p + 2)), x] + Dist[(a*d*f*(n + p + 2) - b*(d*e*(n + 1) + c*f*(p + 1)))/(d*f*(n + p + 2)), Int[(c + d*x)^n*(e + f*x)^p, x], x] /; FreeQ[{a, b, c, d, e, f, n, p}, x] && NeQ[n + p + 2, 0]

Rule 53

Int[1/(Sqrt[(a_) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]), x_Symbol] :> Int[1/Sqrt[a*c - b*(a - c)*x - b^2*x^2], x] /; FreeQ[{a, b, c, d}, x] && EqQ[b + d, 0] && GtQ[a + c, 0]

Rule 619

Int[((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Dist[1/(2*c*((-4*c)/(b^2 - 4*a*c))^p), Subst[Int[Simp[1 - x^2/(b^2 - 4*a*c), x]^p, x], x, b + 2*c*x], x] /; FreeQ[{a, b, c, p}, x] && GtQ[4*a - b^2/c, 0]

Rule 216

Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] := Simp[ArcSin[(Rt[-b, 2]*x)/Sqrt[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]

Rubi steps

$$\begin{aligned}
 \int \frac{1+ax}{\sqrt{ax}\sqrt{1-ax}} dx &= -\frac{\sqrt{ax}\sqrt{1-ax}}{a} + \frac{3}{2} \int \frac{1}{\sqrt{ax}\sqrt{1-ax}} dx \\
 &= -\frac{\sqrt{ax}\sqrt{1-ax}}{a} + \frac{3}{2} \int \frac{1}{\sqrt{ax-a^2x^2}} dx \\
 &= -\frac{\sqrt{ax}\sqrt{1-ax}}{a} - \frac{3 \operatorname{Subst}\left(\int \frac{1}{\sqrt{1-\frac{x^2}{a^2}}} dx, x, a-2a^2x\right)}{2a^2} \\
 &= -\frac{\sqrt{ax}\sqrt{1-ax}}{a} - \frac{3 \sin^{-1}(1-2ax)}{2a}
 \end{aligned}$$

Mathematica [A] time = 0.0242423, size = 61, normalized size = 1.65

$$\frac{\sqrt{ax}(ax-1) + 3\sqrt{x}\sqrt{1-ax} \sin^{-1}(\sqrt{a}\sqrt{x})}{\sqrt{a}\sqrt{-ax(ax-1)}}$$

Antiderivative was successfully verified.

[In] Integrate[(1 + a*x)/(Sqrt[a*x]*Sqrt[1 - a*x]), x]

[Out] (Sqrt[a]*x*(-1 + a*x) + 3*Sqrt[x]*Sqrt[1 - a*x]*ArcSin[Sqrt[a]*Sqrt[x]])/(Sqrt[a]*Sqrt[-(a*x*(-1 + a*x))])

Maple [C] time = 0.015, size = 70, normalized size = 1.9

$$-\frac{\operatorname{csgn}(a)}{2} \sqrt{-ax+1} \left(2 \sqrt{-x(ax-1)} \operatorname{acsgn}(a) - 3 \arctan\left(\frac{1}{2} \frac{\operatorname{csgn}(a)(2ax-1)}{\sqrt{-x(ax-1)}a}\right) \right) \frac{1}{\sqrt{ax}} \frac{1}{\sqrt{-x(ax-1)}a}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((a*x+1)/(a*x)^(1/2)/(-a*x+1)^(1/2), x)

[Out] $-1/2*(-a*x+1)^{(1/2)}*x*(2*(-x*(a*x-1)*a)^{(1/2)}*csgn(a)-3*\arctan(1/2*csgn(a)*(2*a*x-1)/(-x*(a*x-1)*a)^{(1/2)}))*csgn(a)/(a*x)^{(1/2)}/(-x*(a*x-1)*a)^{(1/2)}$

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((a*x+1)/(a*x)^(1/2)/(-a*x+1)^(1/2),x, algorithm="maxima")`

[Out] Exception raised: ValueError

Fricas [A] time = 1.30267, size = 100, normalized size = 2.7

$$\frac{\sqrt{ax}\sqrt{-ax+1} + 3 \arctan\left(\frac{\sqrt{ax}\sqrt{-ax+1}}{ax}\right)}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((a*x+1)/(a*x)^(1/2)/(-a*x+1)^(1/2),x, algorithm="fricas")`

[Out] $-(\text{sqrt}(a*x)*\text{sqrt}(-a*x + 1) + 3*\arctan(\text{sqrt}(a*x)*\text{sqrt}(-a*x + 1)/(a*x)))/a$

Sympy [C] time = 7.76718, size = 133, normalized size = 3.59

$$a \left(\begin{array}{ll} \left(-\frac{i \operatorname{acosh}(\sqrt{a}\sqrt{x})}{a^2} - \frac{i\sqrt{x}\sqrt{ax-1}}{a^2} & \text{for } |ax| > 1 \right) \\ \left(\frac{\operatorname{asin}(\sqrt{a}\sqrt{x})}{a^2} + \frac{x^{\frac{3}{2}}}{\sqrt{a}\sqrt{-ax+1}} - \frac{\sqrt{x}}{a^2\sqrt{-ax+1}} & \text{otherwise} \right) \end{array} \right) + \begin{array}{ll} \left(-\frac{2i \operatorname{acosh}(\sqrt{a}\sqrt{x})}{a} & \text{for } |ax| > 1 \right) \\ \left(\frac{2 \operatorname{asin}(\sqrt{a}\sqrt{x})}{a} & \text{otherwise} \right) \end{array}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((a*x+1)/(a*x)**(1/2)/(-a*x+1)**(1/2),x)`

[Out] $a*\text{Piecewise}((-I*\operatorname{acosh}(\text{sqrt}(a)*\text{sqrt}(x))/a^{**2} - I*\text{sqrt}(x)*\text{sqrt}(a*x - 1)/a^{**}(3/2), \text{Abs}(a*x) > 1), (\operatorname{asin}(\text{sqrt}(a)*\text{sqrt}(x))/a^{**2} + x^{**}(3/2)/(\text{sqrt}(a)*\text{sqrt}(-a$

```
*x + 1)) - sqrt(x)/(a**(3/2)*sqrt(-a*x + 1)), True)) + Piecewise((-2*I*acos
h(sqrt(a)*sqrt(x))/a, Abs(a*x) > 1), (2*asin(sqrt(a)*sqrt(x))/a, True))
```

Giac [A] time = 2.54551, size = 38, normalized size = 1.03

$$-\frac{\sqrt{ax}\sqrt{-ax+1} - 3 \arcsin(\sqrt{ax})}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a*x+1)/(a*x)^(1/2)/(-a*x+1)^(1/2),x, algorithm="giac")
```

```
[Out] -(sqrt(a*x)*sqrt(-a*x + 1) - 3*arcsin(sqrt(a*x)))/a
```

$$3.26 \quad \int \frac{1+ax}{x\sqrt{ax}\sqrt{1-ax}} dx$$

Optimal. Leaf size=29

$$-\frac{2\sqrt{1-ax}}{\sqrt{ax}} - \sin^{-1}(1-2ax)$$

[Out] $(-2*\text{Sqrt}[1 - a*x])/\text{Sqrt}[a*x] - \text{ArcSin}[1 - 2*a*x]$

Rubi [A] time = 0.0160123, antiderivative size = 29, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}} = 0.192$, Rules used = {16, 78, 53, 619, 216}

$$-\frac{2\sqrt{1-ax}}{\sqrt{ax}} - \sin^{-1}(1-2ax)$$

Antiderivative was successfully verified.

[In] $\text{Int}[(1 + a*x)/(x*\text{Sqrt}[a*x]*\text{Sqrt}[1 - a*x]),x]$

[Out] $(-2*\text{Sqrt}[1 - a*x])/\text{Sqrt}[a*x] - \text{ArcSin}[1 - 2*a*x]$

Rule 16

$\text{Int}[(u_.)*(v_.)^{(m_.)}*((b_.)*(v_.)^{(n_.)}), x_Symbol] \rightarrow \text{Dist}[1/b^m, \text{Int}[u*(b*v)^{(m+n)}, x], x] /;$ FreeQ[{b, n}, x] && IntegerQ[m]

Rule 78

$\text{Int}[(a_.) + (b_.)*(x_.)*((c_.) + (d_.)*(x_.)^{(n_.)})*((e_.) + (f_.)*(x_.)^{(p_.)}), x_Symbol] \rightarrow -\text{Simp}[(b*e - a*f)*(c + d*x)^{(n+1)}*(e + f*x)^{(p+1)}/(f*(p+1)*(c*f - d*e)), x] - \text{Dist}[(a*d*f*(n+p+2) - b*(d*e*(n+1) + c*f*(p+1))]/(f*(p+1)*(c*f - d*e)), \text{Int}[(c + d*x)^n*(e + f*x)^{(p+1)}, x], x] /;$ FreeQ[{a, b, c, d, e, f, n}, x] && LtQ[p, -1] && (!LtQ[n, -1] || IntegerQ[p] || !(IntegerQ[n] || !(EqQ[e, 0] || !(EqQ[c, 0] || LtQ[p, n])))

Rule 53

$\text{Int}[1/(\text{Sqrt}[(a_.) + (b_.)*(x_.)]*\text{Sqrt}[(c_.) + (d_.)*(x_.)]), x_Symbol] \rightarrow \text{Int}[1/\text{Sqrt}[a*c - b*(a - c)*x - b^2*x^2], x] /;$ FreeQ[{a, b, c, d}, x] && EqQ[b

+ d, 0] && GtQ[a + c, 0]

Rule 619

Int[((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Dist[1/(2*c*((-4*c)/(b^2 - 4*a*c))^p), Subst[Int[Simp[1 - x^2/(b^2 - 4*a*c), x]^p, x], x, b + 2*c*x], x] /; FreeQ[{a, b, c, p}, x] && GtQ[4*a - b^2/c, 0]

Rule 216

Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqrt[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]

Rubi steps

$$\begin{aligned}
 \int \frac{1+ax}{x\sqrt{ax}\sqrt{1-ax}} dx &= a \int \frac{1+ax}{(ax)^{3/2}\sqrt{1-ax}} dx \\
 &= -\frac{2\sqrt{1-ax}}{\sqrt{ax}} + a \int \frac{1}{\sqrt{ax}\sqrt{1-ax}} dx \\
 &= -\frac{2\sqrt{1-ax}}{\sqrt{ax}} + a \int \frac{1}{\sqrt{ax-a^2x^2}} dx \\
 &= -\frac{2\sqrt{1-ax}}{\sqrt{ax}} - \frac{\text{Subst}\left(\int \frac{1}{\sqrt{1-\frac{x^2}{a^2}}} dx, x, a-2a^2x\right)}{a} \\
 &= -\frac{2\sqrt{1-ax}}{\sqrt{ax}} - \sin^{-1}(1-2ax)
 \end{aligned}$$

Mathematica [A] time = 0.0239233, size = 53, normalized size = 1.83

$$\frac{2(ax + \sqrt{a}\sqrt{x}\sqrt{1-ax} \sin^{-1}(\sqrt{a}\sqrt{x}) - 1)}{\sqrt{-ax(ax-1)}}$$

Antiderivative was successfully verified.

[In] Integrate[(1 + a*x)/(x*Sqrt[a*x]*Sqrt[1 - a*x]), x]

[Out] (2*(-1 + a*x + Sqrt[a]*Sqrt[x]*Sqrt[1 - a*x]*ArcSin[Sqrt[a]*Sqrt[x]]))/Sqrt[-(a*x*(-1 + a*x))]

Maple [C] time = 0.016, size = 69, normalized size = 2.4

$$\operatorname{csgn}(a) \left(\arctan \left(\frac{\operatorname{csgn}(a) (2ax-1)}{2} \frac{1}{\sqrt{-x(ax-1)a}} \right) xa - 2 \sqrt{-x(ax-1)} \operatorname{csgn}(a) \right) \sqrt{-ax+1} \frac{1}{\sqrt{ax}} \frac{1}{\sqrt{-x(ax-1)a}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `int((a*x+1)/x/(a*x)^(1/2)/(-a*x+1)^(1/2),x)`

[Out] `(arctan(1/2*csgn(a)*(2*a*x-1)/(-x*(a*x-1)*a)^(1/2))*x*a-2*(-x*(a*x-1)*a)^(1/2)*csgn(a))*(-a*x+1)^(1/2)*csgn(a)/(a*x)^(1/2)/(-x*(a*x-1)*a)^(1/2)`

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((a*x+1)/x/(a*x)^(1/2)/(-a*x+1)^(1/2),x, algorithm="maxima")`

[Out] Exception raised: ValueError

Fricas [B] time = 1.31399, size = 111, normalized size = 3.83

$$\frac{2 \left(ax \arctan \left(\frac{\sqrt{ax}\sqrt{-ax+1}}{ax} \right) + \sqrt{ax}\sqrt{-ax+1} \right)}{ax}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((a*x+1)/x/(a*x)^(1/2)/(-a*x+1)^(1/2),x, algorithm="fricas")`

[Out] `-2*(a*x*arctan(sqrt(a*x)*sqrt(-a*x + 1)/(a*x)) + sqrt(a*x)*sqrt(-a*x + 1))/(a*x)`

Sympy [C] time = 10.317, size = 71, normalized size = 2.45

$$a \left(\begin{cases} -\frac{2i \operatorname{acosh}(\sqrt{a}\sqrt{x})}{a} & \text{for } |ax| > 1 \\ \frac{2 \operatorname{asin}(\sqrt{a}\sqrt{x})}{a} & \text{otherwise} \end{cases} \right) + \begin{cases} -2\sqrt{-1 + \frac{1}{ax}} & \text{for } \frac{1}{|ax|} > 1 \\ -2i\sqrt{1 - \frac{1}{ax}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a*x+1)/x/(a*x)**(1/2)/(-a*x+1)**(1/2),x)

[Out] a*Piecewise((-2*I*acosh(sqrt(a)*sqrt(x))/a, Abs(a*x) > 1), (2*asin(sqrt(a)*sqrt(x))/a, True)) + Piecewise((-2*sqrt(-1 + 1/(a*x)), 1/Abs(a*x) > 1), (-2*I*sqrt(1 - 1/(a*x)), True))

Giac [A] time = 2.97911, size = 59, normalized size = 2.03

$$-\frac{\sqrt{-ax+1}-1}{\sqrt{ax}} + \frac{\sqrt{ax}}{\sqrt{-ax+1}-1} + 2 \operatorname{arcsin}(\sqrt{ax})$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a*x+1)/x/(a*x)^(1/2)/(-a*x+1)^(1/2),x, algorithm="giac")

[Out] -(sqrt(-a*x + 1) - 1)/sqrt(a*x) + sqrt(a*x)/(sqrt(-a*x + 1) - 1) + 2*arcsin(sqrt(a*x))

$$3.27 \quad \int \frac{1+ax}{x^2\sqrt{ax}\sqrt{1-ax}} dx$$

Optimal. Leaf size=45

$$-\frac{10a\sqrt{1-ax}}{3\sqrt{ax}} - \frac{2a\sqrt{1-ax}}{3(ax)^{3/2}}$$

[Out] $(-2*a*\text{Sqrt}[1 - a*x])/(3*(a*x)^(3/2)) - (10*a*\text{Sqrt}[1 - a*x])/(3*\text{Sqrt}[a*x])$

Rubi [A] time = 0.0098901, antiderivative size = 45, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}} = 0.115$, Rules used = {16, 78, 37}

$$-\frac{10a\sqrt{1-ax}}{3\sqrt{ax}} - \frac{2a\sqrt{1-ax}}{3(ax)^{3/2}}$$

Antiderivative was successfully verified.

[In] $\text{Int}[(1 + a*x)/(x^2*\text{Sqrt}[a*x]*\text{Sqrt}[1 - a*x]), x]$

[Out] $(-2*a*\text{Sqrt}[1 - a*x])/(3*(a*x)^(3/2)) - (10*a*\text{Sqrt}[1 - a*x])/(3*\text{Sqrt}[a*x])$

Rule 16

$\text{Int}[(u_*)*(v_)^(m_*)*((b_*)*(v_))^(n_), x_Symbol] \rightarrow \text{Dist}[1/b^m, \text{Int}[u*(b*v)^(m+n), x], x] /;$ FreeQ[{b, n}, x] && IntegerQ[m]

Rule 78

$\text{Int}[(a_*) + (b_*)*(x_*)*((c_*) + (d_*)*(x_))^(n_*)*((e_*) + (f_*)*(x_))^(p_*)], x_Symbol] \rightarrow -\text{Simp}[(b*e - a*f)*(c + d*x)^(n+1)*(e + f*x)^(p+1)/(f*(p+1)*(c*f - d*e)), x] - \text{Dist}[(a*d*f*(n+p+2) - b*(d*e*(n+1) + c*f*(p+1))]/(f*(p+1)*(c*f - d*e)), \text{Int}[(c + d*x)^n*(e + f*x)^(p+1), x], x] /;$ FreeQ[{a, b, c, d, e, f, n}, x] && LtQ[p, -1] && (!LtQ[n, -1] || IntegerQ[p] || !(IntegerQ[n] || !(EqQ[e, 0] || !(EqQ[c, 0] || LtQ[p, n])))

Rule 37

$\text{Int}[(a_*) + (b_*)*(x_*)^(m_*)*((c_*) + (d_*)*(x_))^(n_*)], x_Symbol] \rightarrow \text{Simp}[(a + b*x)^(m+1)*(c + d*x)^(n+1)/((b*c - a*d)*(m+1)), x] /;$ FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && EqQ[m+n+2, 0] && NeQ[m, -

1]

Rubi steps

$$\begin{aligned}
\int \frac{1+ax}{x^2\sqrt{ax}\sqrt{1-ax}} dx &= a^2 \int \frac{1+ax}{(ax)^{5/2}\sqrt{1-ax}} dx \\
&= -\frac{2a\sqrt{1-ax}}{3(ax)^{3/2}} + \frac{1}{3}(5a^2) \int \frac{1}{(ax)^{3/2}\sqrt{1-ax}} dx \\
&= -\frac{2a\sqrt{1-ax}}{3(ax)^{3/2}} - \frac{10a\sqrt{1-ax}}{3\sqrt{ax}}
\end{aligned}$$

Mathematica [A] time = 0.012325, size = 29, normalized size = 0.64

$$-\frac{2\sqrt{-ax(ax-1)}(5ax+1)}{3ax^2}$$

Antiderivative was successfully verified.

[In] Integrate[(1 + a*x)/(x^2*Sqrt[a*x]*Sqrt[1 - a*x]), x]

[Out] (-2*Sqrt[-(a*x*(-1 + a*x))]*(1 + 5*a*x))/(3*a*x^2)

Maple [A] time = 0.003, size = 25, normalized size = 0.6

$$-\frac{10ax+2}{3x}\sqrt{-ax+1}\frac{1}{\sqrt{ax}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((a*x+1)/x^2/(a*x)^(1/2)/(-a*x+1)^(1/2), x)

[Out] -2/3*(5*a*x+1)/x/(a*x)^(1/2)*(-a*x+1)^(1/2)

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a*x+1)/x^2/(a*x)^(1/2)/(-a*x+1)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 1.45223, size = 69, normalized size = 1.53

$$\frac{2(5ax+1)\sqrt{ax}\sqrt{-ax+1}}{3ax^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a*x+1)/x^2/(a*x)^(1/2)/(-a*x+1)^(1/2),x, algorithm="fricas")
```

```
[Out] -2/3*(5*a*x + 1)*sqrt(a*x)*sqrt(-a*x + 1)/(a*x^2)
```

Sympy [C] time = 8.86366, size = 107, normalized size = 2.38

$$a \left(\begin{cases} -2\sqrt{-1 + \frac{1}{ax}} & \text{for } \frac{1}{|ax|} > 1 \\ -2i\sqrt{1 - \frac{1}{ax}} & \text{otherwise} \end{cases} \right) + \begin{cases} -\frac{4a\sqrt{-1 + \frac{1}{ax}}}{3} - \frac{2\sqrt{-1 + \frac{1}{ax}}}{3x} & \text{for } \frac{1}{|ax|} > 1 \\ -\frac{4ia\sqrt{1 - \frac{1}{ax}}}{3} - \frac{2i\sqrt{1 - \frac{1}{ax}}}{3x} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a*x+1)/x**2/(a*x)**(1/2)/(-a*x+1)**(1/2),x)
```

```
[Out] a*Piecewise((-2*sqrt(-1 + 1/(a*x)), 1/Abs(a*x) > 1), (-2*I*sqrt(1 - 1/(a*x)), True)) + Piecewise((-4*a*sqrt(-1 + 1/(a*x))/3 - 2*sqrt(-1 + 1/(a*x))/(3*x), 1/Abs(a*x) > 1), (-4*I*a*sqrt(1 - 1/(a*x))/3 - 2*I*sqrt(1 - 1/(a*x))/(3*x), True))
```

Giac [B] time = 1.57237, size = 119, normalized size = 2.64

$$\frac{\frac{a^2(\sqrt{-ax+1}-1)^3}{(ax)^{\frac{3}{2}}} + \frac{21a^2(\sqrt{-ax+1}-1)}{\sqrt{ax}} - \frac{\left(a^2 + \frac{21a(\sqrt{-ax+1}-1)^2}{x}\right)(ax)^{\frac{3}{2}}}{(\sqrt{-ax+1}-1)^3}}{12a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a*x+1)/x^2/(a*x)^(1/2)/(-a*x+1)^(1/2),x, algorithm="giac")
```

```
[Out] -1/12*(a^2*(sqrt(-a*x + 1) - 1)^3/(a*x)^(3/2) + 21*a^2*(sqrt(-a*x + 1) - 1)
/sqrt(a*x) - (a^2 + 21*a*(sqrt(-a*x + 1) - 1)^2/x)*(a*x)^(3/2)/(sqrt(-a*x +
1) - 1)^3)/a
```

$$3.28 \quad \int \frac{1+ax}{x^3 \sqrt{ax} \sqrt{1-ax}} dx$$

Optimal. Leaf size=73

$$-\frac{12a^2\sqrt{1-ax}}{5\sqrt{ax}} - \frac{6a^2\sqrt{1-ax}}{5(ax)^{3/2}} - \frac{2a^2\sqrt{1-ax}}{5(ax)^{5/2}}$$

[Out] $(-2*a^2*\text{Sqrt}[1 - a*x])/(5*(a*x)^{(5/2)}) - (6*a^2*\text{Sqrt}[1 - a*x])/(5*(a*x)^{(3/2)}) - (12*a^2*\text{Sqrt}[1 - a*x])/(5*\text{Sqrt}[a*x])$

Rubi [A] time = 0.0190258, antiderivative size = 73, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$, Rules used = {16, 78, 45, 37}

$$-\frac{12a^2\sqrt{1-ax}}{5\sqrt{ax}} - \frac{6a^2\sqrt{1-ax}}{5(ax)^{3/2}} - \frac{2a^2\sqrt{1-ax}}{5(ax)^{5/2}}$$

Antiderivative was successfully verified.

[In] $\text{Int}[(1 + a*x)/(x^3*\text{Sqrt}[a*x]*\text{Sqrt}[1 - a*x]), x]$

[Out] $(-2*a^2*\text{Sqrt}[1 - a*x])/(5*(a*x)^{(5/2)}) - (6*a^2*\text{Sqrt}[1 - a*x])/(5*(a*x)^{(3/2)}) - (12*a^2*\text{Sqrt}[1 - a*x])/(5*\text{Sqrt}[a*x])$

Rule 16

$\text{Int}[(u_*)*(v_)^{(m_*)}*((b_*)*(v_))^{(n_*)}, x_Symbol] := \text{Dist}[1/b^m, \text{Int}[u*(b*v)^{(m+n)}, x], x] /; \text{FreeQ}\{b, n\}, x \ \&\& \ \text{IntegerQ}[m]$

Rule 78

$\text{Int}[(a_*) + (b_*)*(x_*)*((c_*) + (d_*)*(x_))^{(n_*)}*((e_*) + (f_*)*(x_))^{(p_*)}, x_Symbol] := -\text{Simp}[(b*e - a*f)*(c + d*x)^{(n+1)}*(e + f*x)^{(p+1)}/(f*(p+1)*(c*f - d*e)), x] - \text{Dist}[(a*d*f*(n+p+2) - b*(d*e*(n+1) + c*f*(p+1))]/(f*(p+1)*(c*f - d*e)), \text{Int}[(c + d*x)^n*(e + f*x)^{(p+1)}, x], x] /; \text{FreeQ}\{a, b, c, d, e, f, n\}, x \ \&\& \ \text{LtQ}[p, -1] \ \&\& \ (!\text{LtQ}[n, -1] \ || \ \text{IntegerQ}[p] \ || \ !(\text{IntegerQ}[n] \ || \ !(\text{EqQ}[e, 0] \ || \ !(\text{EqQ}[c, 0] \ || \ \text{LtQ}[p, n])))$

Rule 45


```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] := Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*S
implify[m + n + 2])/((b*c - a*d)*(m + 1)), Int[(a + b*x)^Simplify[m + 1]*(c
+ d*x)^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && I
LtQ[Simplify[m + n + 2], 0] && NeQ[m, -1] && !(LtQ[m, -1] && LtQ[n, -1] &&
(EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && (SumSimpler
Q[m, 1] || !SumSimplerQ[n, 1])
```

Rule 37

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] := Simp
[((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] /; FreeQ[{
a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && EqQ[m + n + 2, 0] && NeQ[m, -
1]
```

Rubi steps

$$\begin{aligned}
\int \frac{1+ax}{x^3\sqrt{ax}\sqrt{1-ax}} dx &= a^3 \int \frac{1+ax}{(ax)^{7/2}\sqrt{1-ax}} dx \\
&= -\frac{2a^2\sqrt{1-ax}}{5(ax)^{5/2}} + \frac{1}{5}(9a^3) \int \frac{1}{(ax)^{5/2}\sqrt{1-ax}} dx \\
&= -\frac{2a^2\sqrt{1-ax}}{5(ax)^{5/2}} - \frac{6a^2\sqrt{1-ax}}{5(ax)^{3/2}} + \frac{1}{5}(6a^3) \int \frac{1}{(ax)^{3/2}\sqrt{1-ax}} dx \\
&= -\frac{2a^2\sqrt{1-ax}}{5(ax)^{5/2}} - \frac{6a^2\sqrt{1-ax}}{5(ax)^{3/2}} - \frac{12a^2\sqrt{1-ax}}{5\sqrt{ax}}
\end{aligned}$$

Mathematica [A] time = 0.0146271, size = 37, normalized size = 0.51

$$-\frac{2\sqrt{-ax(ax-1)}(6a^2x^2+3ax+1)}{5ax^3}$$

Antiderivative was successfully verified.

[In] Integrate[(1 + a*x)/(x^3*Sqrt[a*x]*Sqrt[1 - a*x]),x]

[Out] (-2*Sqrt[-(a*x*(-1 + a*x))]*(1 + 3*a*x + 6*a^2*x^2))/(5*a*x^3)

Maple [A] time = 0.004, size = 33, normalized size = 0.5

$$-\frac{12a^2x^2 + 6ax + 2}{5x^2} \sqrt{-ax + 1} \frac{1}{\sqrt{ax}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((a*x+1)/x^3/(a*x)^(1/2)/(-a*x+1)^(1/2),x)

[Out] -2/5*(6*a^2*x^2+3*a*x+1)/x^2/(a*x)^(1/2)*(-a*x+1)^(1/2)

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a*x+1)/x^3/(a*x)^(1/2)/(-a*x+1)^(1/2),x, algorithm="maxima")

[Out] Exception raised: ValueError

Fricas [A] time = 1.49853, size = 85, normalized size = 1.16

$$-\frac{2(6a^2x^2 + 3ax + 1)\sqrt{ax}\sqrt{-ax + 1}}{5ax^3}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a*x+1)/x^3/(a*x)^(1/2)/(-a*x+1)^(1/2),x, algorithm="fricas")

[Out] -2/5*(6*a^2*x^2 + 3*a*x + 1)*sqrt(a*x)*sqrt(-a*x + 1)/(a*x^3)

Sympy [C] time = 12.7437, size = 189, normalized size = 2.59

$$a \left(\left(\begin{array}{l} -\frac{4a\sqrt{-1+\frac{1}{ax}}}{3} - \frac{2\sqrt{-1+\frac{1}{ax}}}{3x} \\ -\frac{4ia\sqrt{1-\frac{1}{ax}}}{3} - \frac{2i\sqrt{1-\frac{1}{ax}}}{3x} \end{array} \right) \text{ for } \frac{1}{|ax|} > 1 \right) + \left(\begin{array}{l} -\frac{16a^2\sqrt{-1+\frac{1}{ax}}}{15} - \frac{8a\sqrt{-1+\frac{1}{ax}}}{15x} - \frac{2\sqrt{-1+\frac{1}{ax}}}{5x^2} \\ -\frac{16ia^2\sqrt{1-\frac{1}{ax}}}{15} - \frac{8ia\sqrt{1-\frac{1}{ax}}}{15x} - \frac{2i\sqrt{1-\frac{1}{ax}}}{5x^2} \end{array} \right) \text{ for } \frac{1}{|ax|} > 1$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a*x+1)/x**3/(a*x)**(1/2)/(-a*x+1)**(1/2),x)

[Out] a*Piecewise((-4*a*sqrt(-1 + 1/(a*x))/3 - 2*sqrt(-1 + 1/(a*x))/(3*x), 1/Abs(a*x) > 1), (-4*I*a*sqrt(1 - 1/(a*x))/3 - 2*I*sqrt(1 - 1/(a*x))/(3*x), True) + Piecewise((-16*a**2*sqrt(-1 + 1/(a*x))/15 - 8*a*sqrt(-1 + 1/(a*x))/(15*x) - 2*sqrt(-1 + 1/(a*x))/(5*x**2), 1/Abs(a*x) > 1), (-16*I*a**2*sqrt(1 - 1/(a*x))/15 - 8*I*a*sqrt(1 - 1/(a*x))/(15*x) - 2*I*sqrt(1 - 1/(a*x))/(5*x**2), True))

Giac [B] time = 1.8686, size = 176, normalized size = 2.41

$$\frac{\frac{a^3(\sqrt{-ax+1}-1)^5}{(ax)^{\frac{5}{2}}} + \frac{15a^3(\sqrt{-ax+1}-1)^3}{(ax)^{\frac{3}{2}}} + \frac{110a^3(\sqrt{-ax+1}-1)}{\sqrt{ax}} - \frac{\left(a^3 + \frac{15a^2(\sqrt{-ax+1}-1)^2}{x} + \frac{110a(\sqrt{-ax+1}-1)^4}{x^2}\right)(ax)^{\frac{5}{2}}}{(\sqrt{-ax+1}-1)^5}}{80a}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a*x+1)/x^3/(a*x)^(1/2)/(-a*x+1)^(1/2),x, algorithm="giac")

[Out] -1/80*(a^3*(sqrt(-a*x + 1) - 1)^5/(a*x)^(5/2) + 15*a^3*(sqrt(-a*x + 1) - 1)^3/(a*x)^(3/2) + 110*a^3*(sqrt(-a*x + 1) - 1)/sqrt(a*x) - (a^3 + 15*a^2*(sqrt(-a*x + 1) - 1)^2/x + 110*a*(sqrt(-a*x + 1) - 1)^4/x^2)*(a*x)^(5/2)/(sqrt(-a*x + 1) - 1)^5)/a

$$3.29 \quad \int \frac{1+ax}{x^4 \sqrt{ax} \sqrt{1-ax}} dx$$

Optimal. Leaf size=97

$$-\frac{208a^3\sqrt{1-ax}}{105\sqrt{ax}} - \frac{104a^3\sqrt{1-ax}}{105(ax)^{3/2}} - \frac{26a^3\sqrt{1-ax}}{35(ax)^{5/2}} - \frac{2a^3\sqrt{1-ax}}{7(ax)^{7/2}}$$

[Out] $(-2*a^3*\text{Sqrt}[1 - a*x])/(7*(a*x)^{(7/2)}) - (26*a^3*\text{Sqrt}[1 - a*x])/(35*(a*x)^{(5/2)}) - (104*a^3*\text{Sqrt}[1 - a*x])/(105*(a*x)^{(3/2)}) - (208*a^3*\text{Sqrt}[1 - a*x])/(105*\text{Sqrt}[a*x])$

Rubi [A] time = 0.0266511, antiderivative size = 97, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$, Rules used = {16, 78, 45, 37}

$$-\frac{208a^3\sqrt{1-ax}}{105\sqrt{ax}} - \frac{104a^3\sqrt{1-ax}}{105(ax)^{3/2}} - \frac{26a^3\sqrt{1-ax}}{35(ax)^{5/2}} - \frac{2a^3\sqrt{1-ax}}{7(ax)^{7/2}}$$

Antiderivative was successfully verified.

[In] $\text{Int}[(1 + a*x)/(x^4*\text{Sqrt}[a*x]*\text{Sqrt}[1 - a*x]), x]$

[Out] $(-2*a^3*\text{Sqrt}[1 - a*x])/(7*(a*x)^{(7/2)}) - (26*a^3*\text{Sqrt}[1 - a*x])/(35*(a*x)^{(5/2)}) - (104*a^3*\text{Sqrt}[1 - a*x])/(105*(a*x)^{(3/2)}) - (208*a^3*\text{Sqrt}[1 - a*x])/(105*\text{Sqrt}[a*x])$

Rule 16

$\text{Int}[(u_*)*(v_)^{(m_*)}*((b_*)*(v_))^{(n_*)}, x_Symbol] := \text{Dist}[1/b^m, \text{Int}[u*(b*v)^{(m+n)}, x], x] /; \text{FreeQ}\{b, n\}, x \ \&\& \ \text{IntegerQ}[m]$

Rule 78

$\text{Int}[(a_*) + (b_*)*(x_*)*((c_*) + (d_*)*(x_))^{(n_*)}*((e_*) + (f_*)*(x_))^{(p_*)}, x_Symbol] := -\text{Simp}[(b*e - a*f)*(c + d*x)^{(n+1)}*(e + f*x)^{(p+1)}/(f*(p+1)*(c*f - d*e)), x] - \text{Dist}[(a*d*f*(n+p+2) - b*(d*e*(n+1) + c*f*(p+1))]/(f*(p+1)*(c*f - d*e)), \text{Int}[(c + d*x)^n*(e + f*x)^{(p+1)}, x], x] /; \text{FreeQ}\{a, b, c, d, e, f, n\}, x \ \&\& \ \text{LtQ}[p, -1] \ \&\& \ (!\text{LtQ}[n, -1] \ || \ \text{IntegerQ}[p] \ || \ !(\text{IntegerQ}[n] \ || \ !(\text{EqQ}[e, 0] \ || \ !(\text{EqQ}[c, 0] \ || \ \text{LtQ}[p, n])))$

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] := Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*S
implify[m + n + 2])/((b*c - a*d)*(m + 1)), Int[(a + b*x)^Simplify[m + 1]*(c
+ d*x)^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && I
LtQ[Simplify[m + n + 2], 0] && NeQ[m, -1] && !(LtQ[m, -1] && LtQ[n, -1] &&
(EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && (SumSimpler
Q[m, 1] || !SumSimplerQ[n, 1])
```

Rule 37

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] := Simp
[((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] /; FreeQ[{
a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && EqQ[m + n + 2, 0] && NeQ[m, -
1]
```

Rubi steps

$$\begin{aligned}
\int \frac{1+ax}{x^4\sqrt{ax}\sqrt{1-ax}} dx &= a^4 \int \frac{1+ax}{(ax)^{9/2}\sqrt{1-ax}} dx \\
&= -\frac{2a^3\sqrt{1-ax}}{7(ax)^{7/2}} + \frac{1}{7} (13a^4) \int \frac{1}{(ax)^{7/2}\sqrt{1-ax}} dx \\
&= -\frac{2a^3\sqrt{1-ax}}{7(ax)^{7/2}} - \frac{26a^3\sqrt{1-ax}}{35(ax)^{5/2}} + \frac{1}{35} (52a^4) \int \frac{1}{(ax)^{5/2}\sqrt{1-ax}} dx \\
&= -\frac{2a^3\sqrt{1-ax}}{7(ax)^{7/2}} - \frac{26a^3\sqrt{1-ax}}{35(ax)^{5/2}} - \frac{104a^3\sqrt{1-ax}}{105(ax)^{3/2}} + \frac{1}{105} (104a^4) \int \frac{1}{(ax)^{3/2}\sqrt{1-ax}} dx \\
&= -\frac{2a^3\sqrt{1-ax}}{7(ax)^{7/2}} - \frac{26a^3\sqrt{1-ax}}{35(ax)^{5/2}} - \frac{104a^3\sqrt{1-ax}}{105(ax)^{3/2}} - \frac{208a^3\sqrt{1-ax}}{105\sqrt{ax}}
\end{aligned}$$

Mathematica [A] time = 0.0166348, size = 45, normalized size = 0.46

$$-\frac{2\sqrt{-ax(ax-1)}(104a^3x^3 + 52a^2x^2 + 39ax + 15)}{105ax^4}$$

Antiderivative was successfully verified.

[In] Integrate[(1 + a*x)/(x^4*Sqrt[a*x]*Sqrt[1 - a*x]), x]

[Out] $(-2\sqrt{-ax(-1+ax)})(15+39ax+52a^2x^2+104a^3x^3)/(105ax^4)$

Maple [A] time = 0.003, size = 41, normalized size = 0.4

$$-\frac{208a^3x^3+104a^2x^2+78ax+30}{105x^3}\sqrt{-ax+1}\frac{1}{\sqrt{ax}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `int((a*x+1)/x^4/(a*x)^(1/2)/(-a*x+1)^(1/2),x)`

[Out] $-2/105*(104a^3x^3+52a^2x^2+39ax+15)/x^3/(a*x)^(1/2)*(-a*x+1)^(1/2)$

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((a*x+1)/x^4/(a*x)^(1/2)/(-a*x+1)^(1/2),x, algorithm="maxima")`

[Out] Exception raised: ValueError

Fricas [A] time = 1.44396, size = 111, normalized size = 1.14

$$\frac{2(104a^3x^3+52a^2x^2+39ax+15)\sqrt{ax}\sqrt{-ax+1}}{105ax^4}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((a*x+1)/x^4/(a*x)^(1/2)/(-a*x+1)^(1/2),x, algorithm="fricas")`

[Out] $-2/105*(104a^3x^3+52a^2x^2+39ax+15)*\sqrt{ax}*\sqrt{-ax+1}/(ax^4)$

Sympy [C] time = 18.8721, size = 274, normalized size = 2.82

$$a \left(\begin{cases} -\frac{16a^2\sqrt{-1+\frac{1}{ax}}}{15} - \frac{8a\sqrt{-1+\frac{1}{ax}}}{15x} - \frac{2\sqrt{-1+\frac{1}{ax}}}{5x^2} & \text{for } \frac{1}{|ax|} > 1 \\ -\frac{16ia^2\sqrt{1-\frac{1}{ax}}}{15} - \frac{8ia\sqrt{1-\frac{1}{ax}}}{15x} - \frac{2i\sqrt{1-\frac{1}{ax}}}{5x^2} & \text{otherwise} \end{cases} \right) + \left(\begin{cases} -\frac{32a^3\sqrt{-1+\frac{1}{ax}}}{35} - \frac{16a^2\sqrt{-1+\frac{1}{ax}}}{35x} - \frac{12a\sqrt{-1+\frac{1}{ax}}}{35x^2} - \frac{2\sqrt{-1+\frac{1}{ax}}}{7x^3} & \text{for } \frac{1}{|ax|} > 1 \\ -\frac{32ia^3\sqrt{1-\frac{1}{ax}}}{35} - \frac{16ia^2\sqrt{1-\frac{1}{ax}}}{35x} - \frac{12ia\sqrt{1-\frac{1}{ax}}}{35x^2} - \frac{2i\sqrt{1-\frac{1}{ax}}}{7x^3} & \text{otherwise} \end{cases} \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a*x+1)/x**4/(a*x)**(1/2)/(-a*x+1)**(1/2),x)

[Out] a*Piecewise((-16*a**2*sqrt(-1 + 1/(a*x))/15 - 8*a*sqrt(-1 + 1/(a*x))/(15*x) - 2*sqrt(-1 + 1/(a*x))/(5*x**2), 1/Abs(a*x) > 1), (-16*I*a**2*sqrt(1 - 1/(a*x))/15 - 8*I*a*sqrt(1 - 1/(a*x))/(15*x) - 2*I*sqrt(1 - 1/(a*x))/(5*x**2), True)) + Piecewise((-32*a**3*sqrt(-1 + 1/(a*x))/35 - 16*a**2*sqrt(-1 + 1/(a*x))/(35*x) - 12*a*sqrt(-1 + 1/(a*x))/(35*x**2) - 2*sqrt(-1 + 1/(a*x))/(7*x**3), 1/Abs(a*x) > 1), (-32*I*a**3*sqrt(1 - 1/(a*x))/35 - 16*I*a**2*sqrt(1 - 1/(a*x))/(35*x) - 12*I*a*sqrt(1 - 1/(a*x))/(35*x**2) - 2*I*sqrt(1 - 1/(a*x))/(7*x**3), True))

Giac [B] time = 2.89268, size = 236, normalized size = 2.43

$$\frac{\frac{15a^4(\sqrt{-ax+1}-1)^7}{(ax)^{\frac{7}{2}}} + \frac{231a^4(\sqrt{-ax+1}-1)^5}{(ax)^{\frac{5}{2}}} + \frac{1435a^4(\sqrt{-ax+1}-1)^3}{(ax)^{\frac{3}{2}}} + \frac{7875a^4(\sqrt{-ax+1}-1)}{\sqrt{ax}} - \frac{\left(15a^4 + \frac{231a^3(\sqrt{-ax+1}-1)^2}{x} + \frac{1435a^2(\sqrt{-ax+1}-1)^4}{x^2} + \frac{7875a(\sqrt{-ax+1}-1)^6}{x^3}\right)}{(\sqrt{-ax+1}-1)^7}}{6720a}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a*x+1)/x^4/(a*x)^(1/2)/(-a*x+1)^(1/2),x, algorithm="giac")

[Out] -1/6720*(15*a^4*(sqrt(-a*x + 1) - 1)^7/(a*x)^(7/2) + 231*a^4*(sqrt(-a*x + 1) - 1)^5/(a*x)^(5/2) + 1435*a^4*(sqrt(-a*x + 1) - 1)^3/(a*x)^(3/2) + 7875*a^4*(sqrt(-a*x + 1) - 1)/sqrt(a*x) - (15*a^4 + 231*a^3*(sqrt(-a*x + 1) - 1)^2/x + 1435*a^2*(sqrt(-a*x + 1) - 1)^4/x^2 + 7875*a*(sqrt(-a*x + 1) - 1)^6/x^3)*(a*x)^(7/2)/(sqrt(-a*x + 1) - 1)^7)/a

$$3.30 \quad \int \frac{1+ax}{x^5 \sqrt{ax} \sqrt{1-ax}} dx$$

Optimal. Leaf size=121

$$-\frac{544a^4\sqrt{1-ax}}{315\sqrt{ax}} - \frac{272a^4\sqrt{1-ax}}{315(ax)^{3/2}} - \frac{68a^4\sqrt{1-ax}}{105(ax)^{5/2}} - \frac{34a^4\sqrt{1-ax}}{63(ax)^{7/2}} - \frac{2a^4\sqrt{1-ax}}{9(ax)^{9/2}}$$

[Out] $(-2*a^4*\text{Sqrt}[1 - a*x])/(9*(a*x)^{(9/2)}) - (34*a^4*\text{Sqrt}[1 - a*x])/(63*(a*x)^{(7/2)}) - (68*a^4*\text{Sqrt}[1 - a*x])/(105*(a*x)^{(5/2)}) - (272*a^4*\text{Sqrt}[1 - a*x])/(315*(a*x)^{(3/2)}) - (544*a^4*\text{Sqrt}[1 - a*x])/(315*\text{Sqrt}[a*x])$

Rubi [A] time = 0.0384211, antiderivative size = 121, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 4, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$, Rules used = {16, 78, 45, 37}

$$-\frac{544a^4\sqrt{1-ax}}{315\sqrt{ax}} - \frac{272a^4\sqrt{1-ax}}{315(ax)^{3/2}} - \frac{68a^4\sqrt{1-ax}}{105(ax)^{5/2}} - \frac{34a^4\sqrt{1-ax}}{63(ax)^{7/2}} - \frac{2a^4\sqrt{1-ax}}{9(ax)^{9/2}}$$

Antiderivative was successfully verified.

[In] $\text{Int}[(1 + a*x)/(x^5*\text{Sqrt}[a*x]*\text{Sqrt}[1 - a*x]), x]$

[Out] $(-2*a^4*\text{Sqrt}[1 - a*x])/(9*(a*x)^{(9/2)}) - (34*a^4*\text{Sqrt}[1 - a*x])/(63*(a*x)^{(7/2)}) - (68*a^4*\text{Sqrt}[1 - a*x])/(105*(a*x)^{(5/2)}) - (272*a^4*\text{Sqrt}[1 - a*x])/(315*(a*x)^{(3/2)}) - (544*a^4*\text{Sqrt}[1 - a*x])/(315*\text{Sqrt}[a*x])$

Rule 16

$\text{Int}[(u_*)*(v_)^{(m_*)}*((b_*)*(v_))^{(n_*)}, x_Symbol] \text{ :> } \text{Dist}[1/b^m, \text{Int}[u*(b*v)^{(m+n)}, x], x] \text{ /; } \text{FreeQ}\{b, n\}, x \text{ \&\& } \text{IntegerQ}[m]$

Rule 78

$\text{Int}[(a_*) + (b_*)*(x_*)*((c_*) + (d_*)*(x_))^{(n_*)}*((e_*) + (f_*)*(x_))^{(p_*)}, x_Symbol] \text{ :> } -\text{Simp}[(b*e - a*f)*(c + d*x)^{(n+1)}*(e + f*x)^{(p+1)}/(f*(p+1)*(c*f - d*e)), x] - \text{Dist}[(a*d*f*(n+p+2) - b*(d*e*(n+1) + c*f*(p+1))]/(f*(p+1)*(c*f - d*e)), \text{Int}[(c + d*x)^n*(e + f*x)^{(p+1)}, x], x \text{ /; } \text{FreeQ}\{a, b, c, d, e, f, n\}, x \text{ \&\& } \text{LtQ}[p, -1] \text{ \&\& } (!\text{LtQ}[n, -1] \text{ || } \text{IntegerQ}[p] \text{ || } !(\text{IntegerQ}[n] \text{ || } !(\text{EqQ}[e, 0] \text{ || } !(\text{EqQ}[c, 0] \text{ || } \text{LtQ}[p, n])))$

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] := Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*S
implify[m + n + 2])/((b*c - a*d)*(m + 1)), Int[(a + b*x)^Simplify[m + 1]*(c
+ d*x)^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && I
LtQ[Simplify[m + n + 2], 0] && NeQ[m, -1] && !(LtQ[m, -1] && LtQ[n, -1] &&
(EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && (SumSimpler
Q[m, 1] || !SumSimplerQ[n, 1])
```

Rule 37

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] := Simp
[((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] /; FreeQ[{
a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && EqQ[m + n + 2, 0] && NeQ[m, -
1]
```

Rubi steps

$$\begin{aligned}
\int \frac{1+ax}{x^5\sqrt{ax}\sqrt{1-ax}} dx &= a^5 \int \frac{1+ax}{(ax)^{11/2}\sqrt{1-ax}} dx \\
&= -\frac{2a^4\sqrt{1-ax}}{9(ax)^{9/2}} + \frac{1}{9} (17a^5) \int \frac{1}{(ax)^{9/2}\sqrt{1-ax}} dx \\
&= -\frac{2a^4\sqrt{1-ax}}{9(ax)^{9/2}} - \frac{34a^4\sqrt{1-ax}}{63(ax)^{7/2}} + \frac{1}{21} (34a^5) \int \frac{1}{(ax)^{7/2}\sqrt{1-ax}} dx \\
&= -\frac{2a^4\sqrt{1-ax}}{9(ax)^{9/2}} - \frac{34a^4\sqrt{1-ax}}{63(ax)^{7/2}} - \frac{68a^4\sqrt{1-ax}}{105(ax)^{5/2}} + \frac{1}{105} (136a^5) \int \frac{1}{(ax)^{5/2}\sqrt{1-ax}} dx \\
&= -\frac{2a^4\sqrt{1-ax}}{9(ax)^{9/2}} - \frac{34a^4\sqrt{1-ax}}{63(ax)^{7/2}} - \frac{68a^4\sqrt{1-ax}}{105(ax)^{5/2}} - \frac{272a^4\sqrt{1-ax}}{315(ax)^{3/2}} + \frac{1}{315} (272a^5) \int \frac{1}{(ax)^{3/2}\sqrt{1-ax}} dx \\
&= -\frac{2a^4\sqrt{1-ax}}{9(ax)^{9/2}} - \frac{34a^4\sqrt{1-ax}}{63(ax)^{7/2}} - \frac{68a^4\sqrt{1-ax}}{105(ax)^{5/2}} - \frac{272a^4\sqrt{1-ax}}{315(ax)^{3/2}} - \frac{544a^4\sqrt{1-ax}}{315\sqrt{ax}}
\end{aligned}$$

Mathematica [A] time = 0.0185621, size = 53, normalized size = 0.44

$$\frac{2\sqrt{-ax(ax-1)}(272a^4x^4 + 136a^3x^3 + 102a^2x^2 + 85ax + 35)}{315ax^5}$$

Antiderivative was successfully verified.

[In] Integrate[(1 + a*x)/(x^5*Sqrt[a*x]*Sqrt[1 - a*x]),x]

[Out] $(-2*\text{Sqrt}[-(a*x*(-1 + a*x))]*(35 + 85*a*x + 102*a^2*x^2 + 136*a^3*x^3 + 272*a^4*x^4))/(315*a*x^5)$

Maple [A] time = 0.005, size = 49, normalized size = 0.4

$$\frac{544 a^4 x^4 + 272 a^3 x^3 + 204 a^2 x^2 + 170 a x + 70}{315 x^4} \sqrt{-a x + 1} \frac{1}{\sqrt{a x}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `int((a*x+1)/x^5/(a*x)^(1/2)/(-a*x+1)^(1/2),x)`

[Out] $-2/315*(272*a^4*x^4+136*a^3*x^3+102*a^2*x^2+85*a*x+35)/x^4/(a*x)^(1/2)*(-a*x+1)^(1/2)$

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((a*x+1)/x^5/(a*x)^(1/2)/(-a*x+1)^(1/2),x, algorithm="maxima")`

[Out] Exception raised: ValueError

Fricas [A] time = 1.40138, size = 131, normalized size = 1.08

$$\frac{2(272 a^4 x^4 + 136 a^3 x^3 + 102 a^2 x^2 + 85 a x + 35) \sqrt{a x} \sqrt{-a x + 1}}{315 a x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((a*x+1)/x^5/(a*x)^(1/2)/(-a*x+1)^(1/2),x, algorithm="fricas")`

[Out] $-2/315*(272*a^4*x^4 + 136*a^3*x^3 + 102*a^2*x^2 + 85*a*x + 35)*\text{sqrt}(a*x)*\text{sqrt}(-a*x + 1)/(a*x^5)$

Sympy [C] time = 29.9426, size = 359, normalized size = 2.97

$$a \left(\begin{cases} \frac{32a^3\sqrt{-1+\frac{1}{ax}}}{35} - \frac{16a^2\sqrt{-1+\frac{1}{ax}}}{35x} - \frac{12a\sqrt{-1+\frac{1}{ax}}}{35x^2} - \frac{2\sqrt{-1+\frac{1}{ax}}}{7x^3} & \text{for } \frac{1}{|ax|} > 1 \\ \frac{32ia^3\sqrt{1-\frac{1}{ax}}}{35} - \frac{16ia^2\sqrt{1-\frac{1}{ax}}}{35x} - \frac{12ia\sqrt{1-\frac{1}{ax}}}{35x^2} - \frac{2i\sqrt{1-\frac{1}{ax}}}{7x^3} & \text{otherwise} \end{cases} \right) + \left(\begin{cases} \frac{256a^4\sqrt{-1+\frac{1}{ax}}}{315} - \frac{128a^3\sqrt{-1+\frac{1}{ax}}}{315x} - \frac{32a^2\sqrt{-1+\frac{1}{ax}}}{105x^2} - \frac{16a\sqrt{-1+\frac{1}{ax}}}{63x^3} \\ \frac{256ia^4\sqrt{1-\frac{1}{ax}}}{315} - \frac{128ia^3\sqrt{1-\frac{1}{ax}}}{315x} - \frac{32ia^2\sqrt{1-\frac{1}{ax}}}{105x^2} - \frac{16ia\sqrt{1-\frac{1}{ax}}}{63x^3} \end{cases} \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a*x+1)/x**5/(a*x)**(1/2)/(-a*x+1)**(1/2), x)

[Out] a*Piecewise((-32*a**3*sqrt(-1 + 1/(a*x))/35 - 16*a**2*sqrt(-1 + 1/(a*x))/(35*x) - 12*a*sqrt(-1 + 1/(a*x))/(35*x**2) - 2*sqrt(-1 + 1/(a*x))/(7*x**3), 1/Abs(a*x) > 1), (-32*I*a**3*sqrt(1 - 1/(a*x))/35 - 16*I*a**2*sqrt(1 - 1/(a*x))/(35*x) - 12*I*a*sqrt(1 - 1/(a*x))/(35*x**2) - 2*I*sqrt(1 - 1/(a*x))/(7*x**3), True)) + Piecewise((-256*a**4*sqrt(-1 + 1/(a*x))/315 - 128*a**3*sqrt(-1 + 1/(a*x))/(315*x) - 32*a**2*sqrt(-1 + 1/(a*x))/(105*x**2) - 16*a*sqrt(-1 + 1/(a*x))/(63*x**3) - 2*sqrt(-1 + 1/(a*x))/(9*x**4), 1/Abs(a*x) > 1), (-256*I*a**4*sqrt(1 - 1/(a*x))/315 - 128*I*a**3*sqrt(1 - 1/(a*x))/(315*x) - 32*I*a**2*sqrt(1 - 1/(a*x))/(105*x**2) - 16*I*a*sqrt(1 - 1/(a*x))/(63*x**3) - 2*I*sqrt(1 - 1/(a*x))/(9*x**4), True))

Giac [B] time = 2.92981, size = 293, normalized size = 2.42

$$\frac{35a^5(\sqrt{-ax+1}-1)^9}{(ax)^2} + \frac{585a^5(\sqrt{-ax+1}-1)^7}{(ax)^2} + \frac{4032a^5(\sqrt{-ax+1}-1)^5}{(ax)^2} + \frac{17640a^5(\sqrt{-ax+1}-1)^3}{(ax)^2} + \frac{83790a^5(\sqrt{-ax+1}-1)}{\sqrt{ax}} - \frac{\left(35a^5 + \frac{585a^4(\sqrt{-ax+1}-1)^2}{x}\right)^2}{80640a}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a*x+1)/x^5/(a*x)^(1/2)/(-a*x+1)^(1/2), x, algorithm="giac")

[Out] -1/80640*(35*a^5*(sqrt(-a*x + 1) - 1)^9/(a*x)^(9/2) + 585*a^5*(sqrt(-a*x + 1) - 1)^7/(a*x)^(7/2) + 4032*a^5*(sqrt(-a*x + 1) - 1)^5/(a*x)^(5/2) + 17640*a^5*(sqrt(-a*x + 1) - 1)^3/(a*x)^(3/2) + 83790*a^5*(sqrt(-a*x + 1) - 1)/sqrt(a*x) - (35*a^5 + 585*a^4*(sqrt(-a*x + 1) - 1)^2/x + 4032*a^3*(sqrt(-a*x + 1) - 1)^4/x^2 + 17640*a^2*(sqrt(-a*x + 1) - 1)^6/x^3 + 83790*a*(sqrt(-a*x + 1) - 1)^8/x^4)*(a*x)^(9/2)/(sqrt(-a*x + 1) - 1)^9/a

$$3.31 \quad \int \frac{-1+2ax}{\sqrt{-1+xx^2}\sqrt{1+x}} dx$$

Optimal. Leaf size=39

$$2a \tan^{-1}\left(\sqrt{x-1}\sqrt{x+1}\right) - \frac{\sqrt{x-1}\sqrt{x+1}}{x}$$

[Out] -((Sqrt[-1 + x]*Sqrt[1 + x])/x) + 2*a*ArcTan[Sqrt[-1 + x]*Sqrt[1 + x]]

Rubi [A] time = 0.0074949, antiderivative size = 39, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.167$, Rules used = {151, 12, 203}

$$2a \tan^{-1}\left(\sqrt{x-1}\sqrt{x+1}\right) - \frac{\sqrt{x-1}\sqrt{x+1}}{x}$$

Antiderivative was successfully verified.

[In] Int[(-1 + 2*a*x)/(Sqrt[-1 + x]*x^2*Sqrt[1 + x]),x]

[Out] -((Sqrt[-1 + x]*Sqrt[1 + x])/x) + 2*a*ArcTan[Sqrt[-1 + x]*Sqrt[1 + x]]

Rule 151

Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_)*((e_.) + (f_.)*(x_))^(p_)*((g_.) + (h_.)*(x_)), x_Symbol] := Simp[((b*g - a*h)*(a + b*x)^(m + 1)*(c + d*x)^(n + 1)*(e + f*x)^(p + 1))/((m + 1)*(b*c - a*d)*(b*e - a*f)), x] + Dist[1/((m + 1)*(b*c - a*d)*(b*e - a*f)), Int[(a + b*x)^(m + 1)*(c + d*x)^n*(e + f*x)^p*Simp[(a*d*f*g - b*(d*e + c*f)*g + b*c*e*h]*(m + 1) - (b*g - a*h)*(d*e*(n + 1) + c*f*(p + 1)) - d*f*(b*g - a*h)*(m + n + p + 3)*x, x], x] /; FreeQ[{a, b, c, d, e, f, g, h, n, p}, x] && LtQ[m, -1] && IntegerQ[m]

Rule 12

Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b_)*(v_)] /; FreeQ[b, x]

Rule 92

Int[1/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))), x_Symbol] := Dist[b*f, Subst[Int[1/(d*(b*e - a*f)^2 + b*f^2*x^2), x],

`x, Sqrt[a + b*x]*Sqrt[c + d*x]], x] /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[2*b*d*e - f*(b*c + a*d), 0]`

Rule 203

`Int[((a_) + (b_)*(x_)^2)^(-1), x_Symbol] := Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a, 0] || GtQ[b, 0])`

Rubi steps

$$\begin{aligned} \int \frac{-1 + 2ax}{\sqrt{-1 + xx^2}\sqrt{1 + x}} dx &= -\frac{\sqrt{-1 + x}\sqrt{1 + x}}{x} + \int \frac{2a}{\sqrt{-1 + xx}\sqrt{1 + x}} dx \\ &= -\frac{\sqrt{-1 + x}\sqrt{1 + x}}{x} + (2a) \int \frac{1}{\sqrt{-1 + xx}\sqrt{1 + x}} dx \\ &= -\frac{\sqrt{-1 + x}\sqrt{1 + x}}{x} + (2a) \text{Subst}\left(\int \frac{1}{1 + x^2} dx, x, \sqrt{-1 + x}\sqrt{1 + x}\right) \\ &= -\frac{\sqrt{-1 + x}\sqrt{1 + x}}{x} + 2a \tan^{-1}\left(\sqrt{-1 + x}\sqrt{1 + x}\right) \end{aligned}$$

Mathematica [A] time = 0.0147942, size = 48, normalized size = 1.23

$$\frac{2a\sqrt{x^2 - 1}x \tan^{-1}\left(\sqrt{x^2 - 1}\right) - x^2 + 1}{\sqrt{x - 1}x\sqrt{x + 1}}$$

Antiderivative was successfully verified.

[In] Integrate[(-1 + 2*a*x)/(Sqrt[-1 + x]*x^2*Sqrt[1 + x]), x]

[Out] (1 - x^2 + 2*a*x*Sqrt[-1 + x^2]*ArcTan[Sqrt[-1 + x^2]])/(Sqrt[-1 + x]*x*Sqrt[1 + x])

Maple [A] time = 0.015, size = 44, normalized size = 1.1

$$\frac{1}{x} \left(-2ax \arctan\left(\frac{1}{\sqrt{x^2 - 1}}\right) - \sqrt{x^2 - 1} \right) \sqrt{-1 + x}\sqrt{1 + x} \frac{1}{\sqrt{x^2 - 1}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `int((2*a*x-1)/x^2/(-1+x)^(1/2)/(1+x)^(1/2),x)`

[Out] $(-2*a*x*\arctan(1/(x^2-1)^{(1/2)})-(x^2-1)^{(1/2)})*(-1+x)^{(1/2)}*(1+x)^{(1/2)}/x/(x^2-1)^{(1/2)}$

Maxima [A] time = 3.18987, size = 28, normalized size = 0.72

$$-2a \arcsin\left(\frac{1}{|x|}\right) - \frac{\sqrt{x^2-1}}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((2*a*x-1)/x^2/(-1+x)^(1/2)/(1+x)^(1/2),x, algorithm="maxima")`

[Out] $-2*a*\arcsin(1/\text{abs}(x)) - \text{sqrt}(x^2 - 1)/x$

Fricas [A] time = 1.3243, size = 104, normalized size = 2.67

$$\frac{4ax \arctan(\sqrt{x+1}\sqrt{x-1} - x) - \sqrt{x+1}\sqrt{x-1} - x}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((2*a*x-1)/x^2/(-1+x)^(1/2)/(1+x)^(1/2),x, algorithm="fricas")`

[Out] $(4*a*x*\arctan(\text{sqrt}(x + 1)*\text{sqrt}(x - 1) - x) - \text{sqrt}(x + 1)*\text{sqrt}(x - 1) - x)/x$

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((2*a*x-1)/x**2/(-1+x)**(1/2)/(1+x)**(1/2),x)`

[Out] Exception raised: ValueError

Giac [A] time = 1.86463, size = 58, normalized size = 1.49

$$-4 a \arctan\left(\frac{1}{2}(\sqrt{x+1} - \sqrt{x-1})^2\right) - \frac{8}{(\sqrt{x+1} - \sqrt{x-1})^4 + 4}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2*a*x-1)/x^2/(-1+x)^(1/2)/(1+x)^(1/2),x, algorithm="giac")

[Out] -4*a*arctan(1/2*(sqrt(x + 1) - sqrt(x - 1))^2) - 8/((sqrt(x + 1) - sqrt(x - 1))^4 + 4)

$$3.32 \quad \int \frac{a^2x^2 - (1-ax)^2}{\sqrt{-1+xx^2}\sqrt{1+x}} dx$$

Optimal. Leaf size=39

$$2a \tan^{-1}\left(\sqrt{x-1}\sqrt{x+1}\right) - \frac{\sqrt{x-1}\sqrt{x+1}}{x}$$

[Out] -((Sqrt[-1 + x]*Sqrt[1 + x])/x) + 2*a*ArcTan[Sqrt[-1 + x]*Sqrt[1 + x]]

Rubi [A] time = 0.0114988, antiderivative size = 39, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 36, $\frac{\text{number of rules}}{\text{integrand size}} = 0.139$, Rules used = {188, 151, 12, 92, 203}

$$2a \tan^{-1}\left(\sqrt{x-1}\sqrt{x+1}\right) - \frac{\sqrt{x-1}\sqrt{x+1}}{x}$$

Antiderivative was successfully verified.

[In] Int[(a^2*x^2 - (1 - a*x)^2)/(Sqrt[-1 + x]*x^2*Sqrt[1 + x]),x]

[Out] -((Sqrt[-1 + x]*Sqrt[1 + x])/x) + 2*a*ArcTan[Sqrt[-1 + x]*Sqrt[1 + x]]

Rule 188

Int[(u_)^(m_.)*(v_)^(n_.)*(w_)^(p_.)*(z_)^(q_.), x_Symbol] :> Int[ExpandToSum[u, x]^m*ExpandToSum[v, x]^n*ExpandToSum[w, x]^p*ExpandToSum[z, x]^q, x] /; FreeQ[{m, n, p, q}, x] && LinearQ[{u, v, w, z}, x] && !LinearMatchQ[{u, v, w, z}, x]

Rule 151

Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_)*((e_.) + (f_.)*(x_))^(p_)*((g_.) + (h_.)*(x_)), x_Symbol] :> Simp[((b*g - a*h)*(a + b*x)^(m + 1)*(c + d*x)^(n + 1)*(e + f*x)^(p + 1))/((m + 1)*(b*c - a*d)*(b*e - a*f)), x] + Dist[1/((m + 1)*(b*c - a*d)*(b*e - a*f)), Int[(a + b*x)^(m + 1)*(c + d*x)^n*(e + f*x)^p*Simp[(a*d*f*g - b*(d*e + c*f)*g + b*c*e*h]*(m + 1) - (b*g - a*h)*(d*e*(n + 1) + c*f*(p + 1)) - d*f*(b*g - a*h)*(m + n + p + 3)*x, x], x] /; FreeQ[{a, b, c, d, e, f, g, h, n, p}, x] && LtQ[m, -1] && IntegerQ[m]

Rule 12


```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b_)*(v_)] /; FreeQ[b, x]
```

Rule 92

```
Int[1/(Sqrt[(a_.) + (b_.)*(x_.)]*Sqrt[(c_.) + (d_.)*(x_.)]*((e_.) + (f_.)*(x_.))), x_Symbol] := Dist[b*f, Subst[Int[1/(d*(b*e - a*f)^2 + b*f^2*x^2), x], x, Sqrt[a + b*x]*Sqrt[c + d*x]], x] /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[2*b*d*e - f*(b*c + a*d), 0]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] := Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a, 0] || GtQ[b, 0])
```

Rubi steps

$$\begin{aligned}
 \int \frac{a^2x^2 - (1 - ax)^2}{\sqrt{-1 + xx^2}\sqrt{1 + x}} dx &= \int \frac{-1 + 2ax}{\sqrt{-1 + xx^2}\sqrt{1 + x}} dx \\
 &= -\frac{\sqrt{-1 + x}\sqrt{1 + x}}{x} + \int \frac{2a}{\sqrt{-1 + xx^2}\sqrt{1 + x}} dx \\
 &= -\frac{\sqrt{-1 + x}\sqrt{1 + x}}{x} + (2a) \int \frac{1}{\sqrt{-1 + xx^2}\sqrt{1 + x}} dx \\
 &= -\frac{\sqrt{-1 + x}\sqrt{1 + x}}{x} + (2a) \text{Subst}\left(\int \frac{1}{1 + x^2} dx, x, \sqrt{-1 + x}\sqrt{1 + x}\right) \\
 &= -\frac{\sqrt{-1 + x}\sqrt{1 + x}}{x} + 2a \tan^{-1}\left(\sqrt{-1 + x}\sqrt{1 + x}\right)
 \end{aligned}$$

Mathematica [A] time = 0.0058114, size = 48, normalized size = 1.23

$$\frac{2a\sqrt{x^2 - 1}x \tan^{-1}\left(\sqrt{x^2 - 1}\right) - x^2 + 1}{\sqrt{x - 1}x\sqrt{x + 1}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a^2*x^2 - (1 - a*x)^2)/(Sqrt[-1 + x]*x^2*Sqrt[1 + x]), x]
```

[Out] $(1 - x^2 + 2ax\sqrt{-1 + x^2} \operatorname{ArcTan}[\sqrt{-1 + x^2}]) / (\sqrt{-1 + x} x \operatorname{Sqrt}[1 + x])$

Maple [A] time = 0.004, size = 44, normalized size = 1.1

$$\frac{1}{x} \left(-2ax \arctan\left(\frac{1}{\sqrt{x^2-1}}\right) - \sqrt{x^2-1} \right) \sqrt{-1+x} \sqrt{1+x} \frac{1}{\sqrt{x^2-1}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `int((a^2*x^2-(-a*x+1)^2)/x^2/(-1+x)^(1/2)/(1+x)^(1/2),x)`

[Out] $(-2ax \arctan(1/(x^2-1)^{1/2}) - (x^2-1)^{1/2}) * (-1+x)^{1/2} * (1+x)^{1/2} / x / (x^2-1)^{1/2}$

Maxima [A] time = 1.76616, size = 28, normalized size = 0.72

$$-2a \arcsin\left(\frac{1}{|x|}\right) - \frac{\sqrt{x^2-1}}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((a^2*x^2-(-a*x+1)^2)/x^2/(-1+x)^(1/2)/(1+x)^(1/2),x, algorithm="maxima")`

[Out] $-2a \arcsin(1/\operatorname{abs}(x)) - \operatorname{sqrt}(x^2 - 1)/x$

Fricas [A] time = 1.32775, size = 104, normalized size = 2.67

$$\frac{4ax \arctan(\sqrt{x+1}\sqrt{x-1} - x) - \sqrt{x+1}\sqrt{x-1} - x}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((a^2*x^2-(-a*x+1)^2)/x^2/(-1+x)^(1/2)/(1+x)^(1/2),x, algorithm="fricas")`

[Out] $(4*a*x*\arctan(\sqrt{x+1})*\sqrt{x-1} - x) - \sqrt{x+1}*\sqrt{x-1} - x)/x$

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{2ax-1}{x^2\sqrt{x-1}\sqrt{x+1}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((a**2*x**2-(-a*x+1)**2)/x**2/(-1+x)**(1/2)/(1+x)**(1/2),x)`

[Out] `Integral((2*a*x - 1)/(x**2*sqrt(x - 1)*sqrt(x + 1)), x)`

Giac [A] time = 2.33417, size = 58, normalized size = 1.49

$$-4a \arctan\left(\frac{1}{2}(\sqrt{x+1} - \sqrt{x-1})^2\right) - \frac{8}{(\sqrt{x+1} - \sqrt{x-1})^4 + 4}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((a^2*x^2-(-a*x+1)^2)/x^2/(-1+x)^(1/2)/(1+x)^(1/2),x, algorithm="giac")`

[Out] `-4*a*arctan(1/2*(sqrt(x + 1) - sqrt(x - 1))^2) - 8/((sqrt(x + 1) - sqrt(x - 1))^4 + 4)`

$$3.33 \quad \int \frac{A+Bx}{\sqrt{a+bx}\sqrt{c+\frac{b(-1+c)x}{a}}\sqrt{e+\frac{b(-1+e)x}{a}}} dx$$

Optimal. Leaf size=145

$$\frac{2\sqrt{a}(aBe + A(b - be))\text{EllipticF}\left(\sin^{-1}\left(\frac{\sqrt{1-c}\sqrt{a+bx}}{\sqrt{a}}\right), \frac{1-e}{1-c}\right)}{b^2\sqrt{1-c}(1-e)} - \frac{2a^{3/2}BE\left(\sin^{-1}\left(\frac{\sqrt{1-c}\sqrt{a+bx}}{\sqrt{a}}\right)\middle|\frac{1-e}{1-c}\right)}{b^2\sqrt{1-c}(1-e)}$$

[Out] $(-2*a^{(3/2)}*B*\text{EllipticE}[\text{ArcSin}[(\text{Sqrt}[1 - c]*\text{Sqrt}[a + b*x])/ \text{Sqrt}[a]], (1 - e)/(1 - c)])/(b^2*\text{Sqrt}[1 - c]*(1 - e)) + (2*\text{Sqrt}[a]*(a*B*e + A*(b - b*e))*\text{EllipticF}[\text{ArcSin}[(\text{Sqrt}[1 - c]*\text{Sqrt}[a + b*x])/ \text{Sqrt}[a]], (1 - e)/(1 - c)])/(b^2*\text{Sqrt}[1 - c]*(1 - e))$

Rubi [A] time = 0.108071, antiderivative size = 145, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 45, $\frac{\text{number of rules}}{\text{integrand size}} = 0.067$, Rules used = {158, 113, 119}

$$\frac{2\sqrt{a}(aBe + A(b - be))F\left(\sin^{-1}\left(\frac{\sqrt{1-c}\sqrt{a+bx}}{\sqrt{a}}\right)\middle|\frac{1-e}{1-c}\right)}{b^2\sqrt{1-c}(1-e)} - \frac{2a^{3/2}BE\left(\sin^{-1}\left(\frac{\sqrt{1-c}\sqrt{a+bx}}{\sqrt{a}}\right)\middle|\frac{1-e}{1-c}\right)}{b^2\sqrt{1-c}(1-e)}$$

Antiderivative was successfully verified.

[In] $\text{Int}[(A + B*x)/(\text{Sqrt}[a + b*x]*\text{Sqrt}[c + (b*(-1 + c)*x)/a]*\text{Sqrt}[e + (b*(-1 + e)*x)/a]), x]$

[Out] $(-2*a^{(3/2)}*B*\text{EllipticE}[\text{ArcSin}[(\text{Sqrt}[1 - c]*\text{Sqrt}[a + b*x])/ \text{Sqrt}[a]], (1 - e)/(1 - c)])/(b^2*\text{Sqrt}[1 - c]*(1 - e)) + (2*\text{Sqrt}[a]*(a*B*e + A*(b - b*e))*\text{EllipticF}[\text{ArcSin}[(\text{Sqrt}[1 - c]*\text{Sqrt}[a + b*x])/ \text{Sqrt}[a]], (1 - e)/(1 - c)])/(b^2*\text{Sqrt}[1 - c]*(1 - e))$

Rule 158

$\text{Int}[(g_.) + (h_.)*(x_)]/(\text{Sqrt}[(a_.) + (b_.)*(x_)]*\text{Sqrt}[(c_.) + (d_.)*(x_)]*\text{Sqrt}[(e_.) + (f_.)*(x_)]), x_Symbol] \rightarrow \text{Dist}[h/f, \text{Int}[\text{Sqrt}[e + f*x]/(\text{Sqrt}[a + b*x]*\text{Sqrt}[c + d*x]), x], x] + \text{Dist}[(f*g - e*h)/f, \text{Int}[1/(\text{Sqrt}[a + b*x]*\text{Sqrt}[c + d*x]*\text{Sqrt}[e + f*x]), x], x] /;$ FreeQ[{a, b, c, d, e, f, g, h}, x] && SimplifierQ[a + b*x, e + f*x] && SimplifierQ[c + d*x, e + f*x]

Rule 113

```
Int[Sqrt[(e_.) + (f_.)*(x_)]/(Sqrt[(a_) + (b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]), x_Symbol] := Simp[(2*Rt[-((b*e - a*f)/d), 2]*EllipticE[ArcSin[Sqrt[a + b*x]/Rt[-((b*c - a*d)/d), 2]]], (f*(b*c - a*d))/(d*(b*e - a*f))]/b, x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[b/(b*c - a*d), 0] && GtQ[b/(b*e - a*f), 0] && !LtQ[-((b*c - a*d)/d), 0] && !(SimplerQ[c + d*x, a + b*x] && GtQ[-(d/(b*c - a*d)), 0] && GtQ[d/(d*e - c*f), 0] && !LtQ[(b*c - a*d)/b, 0])
```

Rule 119

```
Int[1/(Sqrt[(a_) + (b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x_)]), x_Symbol] := Simp[(2*Rt[-(b/d), 2]*EllipticF[ArcSin[Sqrt[a + b*x]/Rt[-(b/d), 2]*Sqrt[(b*c - a*d)/b]]], (f*(b*c - a*d))/(d*(b*e - a*f))]/(b*Sqrt[(b*e - a*f)/b]), x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[(b*c - a*d)/b, 0] && GtQ[(b*e - a*f)/b, 0] && PosQ[-(b/d)] && !(SimplerQ[c + d*x, a + b*x] && GtQ[(d*e - c*f)/d, 0] && GtQ[-(d/b), 0]) && !(SimplerQ[c + d*x, a + b*x] && GtQ[-(b*e) + a*f, f, 0] && GtQ[-(f/b), 0]) && !(SimplerQ[e + f*x, a + b*x] && GtQ[-(d*e) + c*f, f, 0] && GtQ[-(b*e) + a*f, f, 0] && (PosQ[-(f/d)] || PosQ[-(f/b)]))
```

Rubi steps

$$\int \frac{A + Bx}{\sqrt{a + bx} \sqrt{c + \frac{b(-1+c)x}{a}} \sqrt{e + \frac{b(-1+e)x}{a}}} dx = -\frac{(aB) \int \frac{\sqrt{e + \frac{b(-1+e)x}{a}}}{\sqrt{a+bx} \sqrt{c + \frac{b(-1+c)x}{a}}} dx}{b(1-e)} + \left(A + \frac{aBe}{b-be} \right) \int \frac{1}{\sqrt{a + bx} \sqrt{c + \frac{b(-1+c)x}{a}} \sqrt{e + \frac{b(-1+e)x}{a}}} dx$$

$$= -\frac{2a^{3/2} BE \left(\sin^{-1} \left(\frac{\sqrt{1-c}\sqrt{a+bx}}{\sqrt{a}} \right) \Big|_{1-c} \right)}{b^2 \sqrt{1-c}(1-e)} + \frac{2\sqrt{a} \left(A + \frac{aBe}{b-be} \right) F \left(\sin^{-1} \left(\frac{\sqrt{1-c}\sqrt{a+bx}}{\sqrt{a}} \right) \right)}{b\sqrt{1-c}}$$

Mathematica [C] time = 1.44704, size = 309, normalized size = 2.13

$$2\sqrt{\frac{a}{c-1}}(a + bx)^{3/2} \left(\frac{i(e-1)\sqrt{\frac{a}{a+bx} + c-1} \sqrt{\frac{a}{a+bx} + e-1} (aBc + A(b-bc)) \text{EllipticF} \left(i \sinh^{-1} \left(\frac{\sqrt{\frac{a}{c-1}}}{\sqrt{a+bx}} \right), \frac{c-1}{e-1} \right)}{\sqrt{a+bx}} - B\sqrt{\frac{a}{c-1}} \left(\frac{a}{a+bx} + c-1 \right) \left(\frac{a}{a+bx} + e-1 \right) \right) - \frac{ab^2(e-1)\sqrt{\frac{b(c-1)x}{a}} + c\sqrt{\frac{b(e-1)x}{a}} + e}{ab^2(e-1)\sqrt{\frac{b(c-1)x}{a}} + c\sqrt{\frac{b(e-1)x}{a}} + e}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*x)/(Sqrt[a + b*x]*Sqrt[c + (b*(-1 + c)*x)/a]*Sqrt[e + (b*(-1 + e)*x)/a]), x]
```

```
[Out] (-2*Sqrt[a/(-1 + c)]*(a + b*x)^(3/2)*(-(B*Sqrt[a/(-1 + c)]*(-1 + c + a/(a + b*x)))*(-1 + e + a/(a + b*x))) - (I*a*B*(-1 + e)*Sqrt[(-1 + c + a/(a + b*x))]/(-1 + c)]*Sqrt[(-1 + e + a/(a + b*x))/(-1 + e)]*EllipticE[I*ArcSinh[Sqrt[a/(-1 + c)]/Sqrt[a + b*x]], (-1 + c)/(-1 + e)]/Sqrt[a + b*x] + (I*(a*B*c + A*(b - b*c))*(-1 + e)*Sqrt[(-1 + c + a/(a + b*x))]/(-1 + c)]*Sqrt[(-1 + e + a/(a + b*x))/(-1 + e)]*EllipticF[I*ArcSinh[Sqrt[a/(-1 + c)]/Sqrt[a + b*x]], (-1 + c)/(-1 + e)]/Sqrt[a + b*x]))/(a*b^2*(-1 + e)*Sqrt[c + (b*(-1 + c)*x)/a]*Sqrt[e + (b*(-1 + e)*x)/a])
```

Maple [B] time = 0.047, size = 624, normalized size = 4.3

$$-2 \frac{a}{\sqrt{bx+a}(-1+e)(c-1)^2 b^2} \left(A \text{EllipticF} \left(\sqrt{-\frac{(-1+e)(bcx+ac-bx)}{a(c-e)}}, \sqrt{-\frac{c-e}{-1+e}} \right) bc^2 - A \text{EllipticF} \left(\sqrt{-\frac{(-1+e)(bcx+ac-bx)}{a(c-e)}}, \sqrt{-\frac{c-e}{-1+e}} \right) \right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((B*x+A)/(b*x+a)^(1/2)/(c+b*(c-1)*x/a)^(1/2)/(e+b*(-1+e)*x/a)^(1/2), x)
```

```
[Out] -2*(A*EllipticF((-(-1+e)*(b*c*x+a*c-b*x)/a/(c-e))^(1/2), (-(-1+e)/(c-1))^(1/2))*b*c^2-A*EllipticF((-(-1+e)*(b*c*x+a*c-b*x)/a/(c-e))^(1/2), (-(-1+e)/(c-1))^(1/2))*b*c*e-B*EllipticF((-(-1+e)*(b*c*x+a*c-b*x)/a/(c-e))^(1/2), (-(-1+e)/(c-1))^(1/2))*a*c^2+B*EllipticF((-(-1+e)*(b*c*x+a*c-b*x)/a/(c-e))^(1/2), (-(-1+e)/(c-1))^(1/2))*a*c*e-A*EllipticF((-(-1+e)*(b*c*x+a*c-b*x)/a/(c-e))^(1/2), (-(-1+e)/(c-1))^(1/2))*b*c+A*EllipticF((-(-1+e)*(b*c*x+a*c-b*x)/a/(c-e))^(1/2), (-(-1+e)/(c-1))^(1/2))*b*e+B*EllipticF((-(-1+e)*(b*c*x+a*c-b*x)/a/(c-e))^(1/2), (-(-1+e)/(c-1))^(1/2))*a*c-B*EllipticF((-(-1+e)*(b*c*x+a*c-b*x)/a/(c-e))^(1/2), (-(-1+e)/(c-1))^(1/2))*a*e-B*EllipticE((-(-1+e)*(b*c*x+a*c-b*x)/a/(c-e))^(1/2), (-(-1+e)/(c-1))^(1/2))*a*c+B*EllipticE((-(-1+e)*(b*c*x+a*c-b*x)/a/(c-e))^(1/2), (-(-1+e)/(c-1))^(1/2))*a*e)*((c-1)*(b*e*x+a*e-b*x)/a/(c-e))^(1/2)*(-(b*x+a)*(c-1)/a)^(1/2)*(-(-1+e)*(b*c*x+a*c-b*x)/a/(c-e))^(1/2)*a/(b*x+a)^(1/2)/((b*c*x+a*c-b*x)/a)^(1/2)/((b*e*x+a*e-b*x)/a)^(1/2)/(-1+e)/(c-1)^2/b^2
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{Bx + A}{\sqrt{bx+a} \sqrt{\frac{b(c-1)x}{a} + c} \sqrt{\frac{b(e-1)x}{a} + e}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((B*x+A)/(b*x+a)^(1/2)/(c+b*(-1+c)*x/a)^(1/2)/(e+b*(-1+e)*x/a)^(1/2),x, algorithm="maxima")

[Out] integrate((B*x + A)/(sqrt(b*x + a)*sqrt(b*(c - 1)*x/a + c)*sqrt(b*(e - 1)*x/a + e)), x)

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral} \left(\frac{(Ba^2x + Aa^2)\sqrt{bx + a}\sqrt{\frac{ac+(bc-b)x}{a}}\sqrt{\frac{ae+(be-b)x}{a}}}{a^3ce - (b^3c - b^3 - (b^3c - b^3)e)x^3 - (2ab^2c - ab^2 - (3ab^2c - 2ab^2)e)x^2 - (a^2bc - (3a^2bc - a^2b)e)x}, x \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((B*x+A)/(b*x+a)^(1/2)/(c+b*(-1+c)*x/a)^(1/2)/(e+b*(-1+e)*x/a)^(1/2),x, algorithm="fricas")

[Out] integral((B*a^2*x + A*a^2)*sqrt(b*x + a)*sqrt((a*c + (b*c - b)*x)/a)*sqrt((a*e + (b*e - b)*x)/a)/(a^3*c*e - (b^3*c - b^3 - (b^3*c - b^3)*e)*x^3 - (2*a*b^2*c - a*b^2 - (3*a*b^2*c - 2*a*b^2)*e)*x^2 - (a^2*b*c - (3*a^2*b*c - a^2*b)*e)*x), x)

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((B*x+A)/(b*x+a)**(1/2)/(c+b*(-1+c)*x/a)**(1/2)/(e+b*(-1+e)*x/a)**(1/2),x)

[Out] Timed out

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{Bx + A}{\sqrt{bx + a}\sqrt{\frac{b(c-1)x}{a} + c}\sqrt{\frac{b(e-1)x}{a} + e}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((B*x+A)/(b*x+a)^(1/2)/(c+b*(-1+c)*x/a)^(1/2)/(e+b*(-1+e)*x/a)^(1/2),x, algorithm="giac")
```

```
[Out] integrate((B*x + A)/(sqrt(b*x + a)*sqrt(b*(c - 1)*x/a + c)*sqrt(b*(e - 1)*x/a + e)), x)
```


$$3.34 \quad \int \frac{A+Bx}{\sqrt{a+bx}\sqrt{c+dx}\sqrt{e+\frac{b(-1+e)x}{a}}} dx$$

Optimal. Leaf size=221

$$\frac{2\sqrt{a}(aBe + A(b - be))\sqrt{\frac{b(c+dx)}{bc-ad}} \text{EllipticF}\left(\sin^{-1}\left(\frac{\sqrt{1-e}\sqrt{a+bx}}{\sqrt{a}}\right), -\frac{ad}{(1-e)(bc-ad)}\right) - 2aB\sqrt{ad-bc}\sqrt{\frac{b(c+dx)}{bc-ad}} E\left(\sin^{-1}\left(\frac{\sqrt{d}\sqrt{a+bx}}{\sqrt{ad-bc}}\right)\right)}{b^2(1-e)^{3/2}\sqrt{c+dx} - b^2\sqrt{d}(1-e)\sqrt{c+dx}}$$

```
[Out] (-2*a*B*Sqrt[-(b*c) + a*d]*Sqrt[(b*(c + d*x))/(b*c - a*d)]*EllipticE[ArcSin
[(Sqrt[d]*Sqrt[a + b*x])/Sqrt[-(b*c) + a*d]], -(((b*c - a*d)*(1 - e))/(a*d)
)])/ (b^2*Sqrt[d]*(1 - e)*Sqrt[c + d*x]) + (2*Sqrt[a]*(a*B*e + A*(b - b*e))*
Sqrt[(b*(c + d*x))/(b*c - a*d)]*EllipticF[ArcSin[(Sqrt[1 - e]*Sqrt[a + b*x]
)/Sqrt[a]], -((a*d)/((b*c - a*d)*(1 - e))))]/(b^2*(1 - e)^(3/2)*Sqrt[c + d*
x])
```

Rubi [A] time = 0.199431, antiderivative size = 221, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 39, $\frac{\text{number of rules}}{\text{integrand size}} = 0.128$, Rules used = {158, 114, 113, 121, 119}

$$\frac{2\sqrt{a}(aBe + A(b - be))\sqrt{\frac{b(c+dx)}{bc-ad}} F\left(\sin^{-1}\left(\frac{\sqrt{1-e}\sqrt{a+bx}}{\sqrt{a}}\right) \middle| -\frac{ad}{(bc-ad)(1-e)}\right) - 2aB\sqrt{ad-bc}\sqrt{\frac{b(c+dx)}{bc-ad}} E\left(\sin^{-1}\left(\frac{\sqrt{d}\sqrt{a+bx}}{\sqrt{ad-bc}}\right) \middle| -\frac{(bc-ad)}{ad}\right)}{b^2(1-e)^{3/2}\sqrt{c+dx} - b^2\sqrt{d}(1-e)\sqrt{c+dx}}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*x)/(Sqrt[a + b*x]*Sqrt[c + d*x]*Sqrt[e + (b*(-1 + e)*x)/a]), x]
```

```
[Out] (-2*a*B*Sqrt[-(b*c) + a*d]*Sqrt[(b*(c + d*x))/(b*c - a*d)]*EllipticE[ArcSin
[(Sqrt[d]*Sqrt[a + b*x])/Sqrt[-(b*c) + a*d]], -(((b*c - a*d)*(1 - e))/(a*d)
)])/ (b^2*Sqrt[d]*(1 - e)*Sqrt[c + d*x]) + (2*Sqrt[a]*(a*B*e + A*(b - b*e))*
Sqrt[(b*(c + d*x))/(b*c - a*d)]*EllipticF[ArcSin[(Sqrt[1 - e]*Sqrt[a + b*x]
)/Sqrt[a]], -((a*d)/((b*c - a*d)*(1 - e))))]/(b^2*(1 - e)^(3/2)*Sqrt[c + d*
x])
```

Rule 158

```
Int[((g_.) + (h_.)*(x_))/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]*
Sqrt[(e_.) + (f_.)*(x_)]), x_Symbol] := Dist[h/f, Int[Sqrt[e + f*x]/(Sqrt[a
+ b*x]*Sqrt[c + d*x]), x], x] + Dist[(f*g - e*h)/f, Int[1/(Sqrt[a + b*x]*Sq
rt[c + d*x]*Sqrt[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x] &&
```

SimplerQ[a + b*x, e + f*x] && SimplerQ[c + d*x, e + f*x]

Rule 114

```
Int[Sqrt[(e_.) + (f_.)*(x_.)]/(Sqrt[(a_.) + (b_.)*(x_.)]*Sqrt[(c_.) + (d_.)*(x_.)]), x_Symbol] := Dist[(Sqrt[e + f*x]*Sqrt[(b*(c + d*x))/(b*c - a*d)])/(Sqrt[c + d*x]*Sqrt[(b*(e + f*x))/(b*e - a*f)]), Int[Sqrt[(b*e)/(b*e - a*f) + (b*f*x)/(b*e - a*f)]/(Sqrt[a + b*x]*Sqrt[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && !(GtQ[b/(b*c - a*d), 0] && GtQ[b/(b*e - a*f), 0]) && !LtQ[-((b*c - a*d)/d), 0]
```

Rule 113

```
Int[Sqrt[(e_.) + (f_.)*(x_.)]/(Sqrt[(a_.) + (b_.)*(x_.)]*Sqrt[(c_.) + (d_.)*(x_.)]), x_Symbol] := Simp[(2*Rt[-((b*e - a*f)/d), 2]*EllipticE[ArcSin[Sqrt[a + b*x]/Rt[-((b*c - a*d)/d), 2]], (f*(b*c - a*d))/(d*(b*e - a*f))]/b, x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[b/(b*c - a*d), 0] && GtQ[b/(b*e - a*f), 0] && !LtQ[-((b*c - a*d)/d), 0] && !(SimplerQ[c + d*x, a + b*x] && GtQ[-(d/(b*c - a*d)), 0] && GtQ[d/(d*e - c*f), 0] && !LtQ[(b*c - a*d)/b, 0])
```

Rule 121

```
Int[1/(Sqrt[(a_.) + (b_.)*(x_.)]*Sqrt[(c_.) + (d_.)*(x_.)]*Sqrt[(e_.) + (f_.)*(x_.)]), x_Symbol] := Dist[Sqrt[(b*(c + d*x))/(b*c - a*d)]/Sqrt[c + d*x], Int[1/(Sqrt[a + b*x]*Sqrt[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)]*Sqrt[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && !GtQ[(b*c - a*d)/b, 0] && SimplerQ[a + b*x, c + d*x] && SimplerQ[a + b*x, e + f*x]
```

Rule 119

```
Int[1/(Sqrt[(a_.) + (b_.)*(x_.)]*Sqrt[(c_.) + (d_.)*(x_.)]*Sqrt[(e_.) + (f_.)*(x_.)]), x_Symbol] := Simp[(2*Rt[-(b/d), 2]*EllipticF[ArcSin[Sqrt[a + b*x]/Rt[-(b/d), 2]*Sqrt[(b*c - a*d)/b]]], (f*(b*c - a*d))/(d*(b*e - a*f))]/(b*Sqrt[(b*e - a*f)/b]), x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[(b*c - a*d)/b, 0] && GtQ[(b*e - a*f)/b, 0] && PosQ[-(b/d)] && !(SimplerQ[c + d*x, a + b*x] && GtQ[(d*e - c*f)/d, 0] && GtQ[-(d/b), 0]) && !(SimplerQ[c + d*x, a + b*x] && GtQ[(-(b*e) + a*f)/f, 0] && GtQ[-(f/b), 0]) && !(SimplerQ[e + f*x, a + b*x] && GtQ[(-(d*e) + c*f)/f, 0] && GtQ[(-(b*e) + a*f)/f, 0] && (PosQ[-(f/d)] || PosQ[-(f/b)]))
```

Rubi steps

$$\begin{aligned}
\int \frac{A + Bx}{\sqrt{a + bx}\sqrt{c + dx}\sqrt{e + \frac{b(-1+e)x}{a}}} dx &= -\frac{(aB) \int \frac{\sqrt{e + \frac{b(-1+e)x}{a}}}{\sqrt{a+bx}\sqrt{c+dx}} dx}{b(1-e)} + \left(A + \frac{aBe}{b-be}\right) \int \frac{1}{\sqrt{a + bx}\sqrt{c + dx}\sqrt{e + \frac{b(-1+e)x}{a}}} dx \\
&= \frac{\left(\left(A + \frac{aBe}{b-be}\right) \sqrt{\frac{b(c+dx)}{bc-ad}}\right) \int \frac{1}{\sqrt{a+bx}\sqrt{\frac{bc}{bc-ad} + \frac{bdx}{bc-ad}}\sqrt{e + \frac{b(-1+e)x}{a}}} dx}{\sqrt{c + dx}} - \frac{\left(aB\sqrt{\frac{b(c+dx)}{bc-ad}}\sqrt{e + \frac{b(-1+e)x}{a}}\right)}{b(1-e)\sqrt{c + dx}} \\
&= -\frac{2aB\sqrt{-bc + ad}\sqrt{\frac{b(c+dx)}{bc-ad}} E\left(\sin^{-1}\left(\frac{\sqrt{d}\sqrt{a+bx}}{\sqrt{-bc+ad}}\right) \mid -\frac{(bc-ad)(1-e)}{ad}\right)}{b^2\sqrt{d}(1-e)\sqrt{c + dx}} + \frac{2\sqrt{a}(aBe + A(b-be))}{b(1-e)\sqrt{c + dx}}
\end{aligned}$$

Mathematica [C] time = 2.17453, size = 312, normalized size = 1.41

$$2\sqrt{\frac{a}{e-1}}(a + bx)^{3/2} \left(\frac{id\sqrt{\frac{a}{a+bx} + e - 1}}{e-1} (aBe + A(b-be)) \sqrt{\frac{b(c+dx)}{d(a+bx)}} \text{EllipticF}\left(i \sinh^{-1}\left(\frac{\sqrt{\frac{a}{e-1}}}{\sqrt{a+bx}}\right), \frac{(e-1)(bc-ad)}{ad}\right)}{\sqrt{a+bx}} - \frac{bB\sqrt{\frac{a}{e-1}}(c+dx)(ae+b(e-1)x)}{(a+bx)^2} - \frac{iaBd\sqrt{\frac{a}{a+bx} + e - 1}}{e-1} \right)$$

$$ab^2d\sqrt{c + dx}\sqrt{\frac{b(e-1)x}{a} + e}$$

Antiderivative was successfully verified.

[In] Integrate[(A + B*x)/(Sqrt[a + b*x]*Sqrt[c + d*x]*Sqrt[e + (b*(-1 + e)*x)/a]), x]

[Out] (-2*Sqrt[a/(-1 + e)]*(a + b*x)^(3/2)*(-(b*B*Sqrt[a/(-1 + e)]*(c + d*x)*(a*e + b*(-1 + e)*x))/(a + b*x)^2) - (I*a*B*d*Sqrt[(b*(c + d*x))/(d*(a + b*x))]*Sqrt[(-1 + e + a/(a + b*x))/(-1 + e)]*EllipticE[I*ArcSinh[Sqrt[a/(-1 + e)]/Sqrt[a + b*x]], ((b*c - a*d)*(-1 + e))/(a*d))]/Sqrt[a + b*x] + (I*d*(a*B*e + A*(b - b*e))*Sqrt[(b*(c + d*x))/(d*(a + b*x))]*Sqrt[(-1 + e + a/(a + b*x))/(-1 + e)]*EllipticF[I*ArcSinh[Sqrt[a/(-1 + e)]/Sqrt[a + b*x]], ((b*c - a*d)*(-1 + e))/(a*d))]/Sqrt[a + b*x]))/(a*b^2*d*Sqrt[c + d*x]*Sqrt[e + (b*(-1 + e)*x)/a])

Maple [B] time = 0.039, size = 940, normalized size = 4.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] `int((B*x+A)/(b*x+a)^(1/2)/(d*x+c)^(1/2)/(e+b*(-1+e)*x/a)^(1/2),x)`

[Out] $2*(b*x+a)^{(1/2)}*(d*x+c)^{(1/2)}*(d*(b*e*x+a*e-b*x)/(a*d*e-b*c*e+b*c))^{(1/2)}*(-(b*x+a)*(-1+e)/a)^{(1/2)}*(-(d*x+c)*b*(-1+e)/(a*d*e-b*c*e+b*c))^{(1/2)}*(A*EllipticF((d*(b*e*x+a*e-b*x)/(a*d*e-b*c*e+b*c))^{(1/2)},((a*d*e-b*c*e+b*c)/d/a)^{(1/2)})*a*b*d*e^2-A*EllipticF((d*(b*e*x+a*e-b*x)/(a*d*e-b*c*e+b*c))^{(1/2)},((a*d*e-b*c*e+b*c)/d/a)^{(1/2)})*b^2*c*e^2-B*EllipticF((d*(b*e*x+a*e-b*x)/(a*d*e-b*c*e+b*c))^{(1/2)},((a*d*e-b*c*e+b*c)/d/a)^{(1/2)})*a^2*d*e^2+B*EllipticF((d*(b*e*x+a*e-b*x)/(a*d*e-b*c*e+b*c))^{(1/2)},((a*d*e-b*c*e+b*c)/d/a)^{(1/2)})*a*b*c*e^2-A*EllipticF((d*(b*e*x+a*e-b*x)/(a*d*e-b*c*e+b*c))^{(1/2)},((a*d*e-b*c*e+b*c)/d/a)^{(1/2)})*a*b*d*e+2*A*EllipticF((d*(b*e*x+a*e-b*x)/(a*d*e-b*c*e+b*c))^{(1/2)},((a*d*e-b*c*e+b*c)/d/a)^{(1/2)})*b^2*c*e+B*EllipticF((d*(b*e*x+a*e-b*x)/(a*d*e-b*c*e+b*c))^{(1/2)},((a*d*e-b*c*e+b*c)/d/a)^{(1/2)})*a^2*d*e-2*B*EllipticF((d*(b*e*x+a*e-b*x)/(a*d*e-b*c*e+b*c))^{(1/2)},((a*d*e-b*c*e+b*c)/d/a)^{(1/2)})*a*b*c*e-B*EllipticE((d*(b*e*x+a*e-b*x)/(a*d*e-b*c*e+b*c))^{(1/2)},((a*d*e-b*c*e+b*c)/d/a)^{(1/2)})*a^2*d*e+B*EllipticE((d*(b*e*x+a*e-b*x)/(a*d*e-b*c*e+b*c))^{(1/2)},((a*d*e-b*c*e+b*c)/d/a)^{(1/2)})*a*b*c*e-A*EllipticF((d*(b*e*x+a*e-b*x)/(a*d*e-b*c*e+b*c))^{(1/2)},((a*d*e-b*c*e+b*c)/d/a)^{(1/2)})*b^2*c+B*EllipticF((d*(b*e*x+a*e-b*x)/(a*d*e-b*c*e+b*c))^{(1/2)},((a*d*e-b*c*e+b*c)/d/a)^{(1/2)})*a*b*c-B*EllipticE((d*(b*e*x+a*e-b*x)/(a*d*e-b*c*e+b*c))^{(1/2)},((a*d*e-b*c*e+b*c)/d/a)^{(1/2)})*a*b*c)/((b*e*x+a*e-b*x)/a)^{(1/2)}/(b*d*x^2+a*d*x+b*c*x+a*c)/(-1+e)^2/b^2/d$

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{Bx + A}{\sqrt{bx + a}\sqrt{dx + c}\sqrt{\frac{b(e-1)x}{a} + e}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((B*x+A)/(b*x+a)^(1/2)/(d*x+c)^(1/2)/(e+b*(-1+e)*x/a)^(1/2),x, algorithm="maxima")`

[Out] `integrate((B*x + A)/(sqrt(b*x + a)*sqrt(d*x + c)*sqrt(b*(e - 1)*x/a + e)),x)`

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral} \left(\frac{(Bax + Aa)\sqrt{bx + a}\sqrt{dx + c}\sqrt{\frac{ae+(be-b)x}{a}}}{a^2ce + (b^2de - b^2d)x^3 - (b^2c + abd - (b^2c + 2abd)e)x^2 - (abc - (2abc + a^2d)e)x}, x \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((B*x+A)/(b*x+a)^(1/2)/(d*x+c)^(1/2)/(e+b*(-1+e)*x/a)^(1/2),x, algorithm="fricas")

[Out] integral((B*a*x + A*a)*sqrt(b*x + a)*sqrt(d*x + c)*sqrt((a*e + (b*e - b)*x)/a)/(a^2*c*e + (b^2*d*e - b^2*d)*x^3 - (b^2*c + a*b*d - (b^2*c + 2*a*b*d)*e)*x^2 - (a*b*c - (2*a*b*c + a^2*d)*e)*x), x)

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((B*x+A)/(b*x+a)**(1/2)/(d*x+c)**(1/2)/(e+b*(-1+e)*x/a)**(1/2),x)

[Out] Timed out

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{Bx + A}{\sqrt{bx + a}\sqrt{dx + c}\sqrt{\frac{b(e-1)x}{a} + e}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((B*x+A)/(b*x+a)^(1/2)/(d*x+c)^(1/2)/(e+b*(-1+e)*x/a)^(1/2),x, algorithm="giac")

[Out] integrate((B*x + A)/(sqrt(b*x + a)*sqrt(d*x + c)*sqrt(b*(e - 1)*x/a + e)), x)

3.35 $\int \sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^3 dx$

Optimal. Leaf size=281

$$\frac{522167393\sqrt{\frac{11}{6}}\sqrt{5-2x}\text{EllipticF}\left(\sin^{-1}\left(\sqrt{\frac{3}{11}}\sqrt{4x+1}\right), \frac{1}{3}\right)}{23328\sqrt{2x-5}} + \frac{2}{55}\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}(5x+7)^4 - \frac{427\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}(5x+7)^2}{2970} - \frac{17561\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}(5x+7)}{8910}$$

```
[Out] (-1182926269*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/1603800 - (1224313
9*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(7 + 5*x))/356400 - (17561*Sqr
t[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(7 + 5*x)^2)/8910 - (427*Sqrt[2 - 3
*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(7 + 5*x)^3)/2970 + (2*Sqrt[2 - 3*x]*Sqrt[
-5 + 2*x]*Sqrt[1 + 4*x]*(7 + 5*x)^4)/55 - (6489123157*Sqrt[11]*Sqrt[-5 + 2*
x]*EllipticE[ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2])/(699840*Sqrt[5 - 2*
x]) + (522167393*Sqrt[11/6]*Sqrt[5 - 2*x]*EllipticF[ArcSin[Sqrt[3/11]*Sqrt[
1 + 4*x]], 1/3])/(23328*Sqrt[-5 + 2*x])
```

Rubi [A] time = 0.389425, antiderivative size = 281, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 8, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}} = 0.229$, Rules used = {161, 1600, 1615, 158, 114, 113, 121, 119}

$$\frac{2}{55}\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}(5x+7)^4 - \frac{427\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}(5x+7)^3}{2970} - \frac{17561\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}(5x+7)^2}{8910}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(7 + 5*x)^3,x]
```

```
[Out] (-1182926269*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/1603800 - (1224313
9*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(7 + 5*x))/356400 - (17561*Sqr
t[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(7 + 5*x)^2)/8910 - (427*Sqrt[2 - 3
*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(7 + 5*x)^3)/2970 + (2*Sqrt[2 - 3*x]*Sqrt[
-5 + 2*x]*Sqrt[1 + 4*x]*(7 + 5*x)^4)/55 - (6489123157*Sqrt[11]*Sqrt[-5 + 2*
x]*EllipticE[ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2])/(699840*Sqrt[5 - 2*
x]) + (522167393*Sqrt[11/6]*Sqrt[5 - 2*x]*EllipticF[ArcSin[Sqrt[3/11]*Sqrt[
1 + 4*x]], 1/3])/(23328*Sqrt[-5 + 2*x])
```

Rule 161

```
Int[((a_.) + (b_.)*(x_))^(m_)*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(
x_)]*Sqrt[(g_.) + (h_.)*(x_)], x_Symbol] := Simp[(2*(a + b*x)^(m + 1)*Sqrt[
```

```

c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(b*(2*m + 5)), x] + Dist[1/(b*(2*m +
5)), Int[((a + b*x)^m*Simp[3*b*c*e*g - a*(d*e*g + c*f*g + c*e*h) + 2*(b*(d*
e*g + c*f*g + c*e*h) - a*(d*f*g + d*e*h + c*f*h))*x - (3*a*d*f*h - b*(d*f*g
+ d*e*h + c*f*h))*x^2, x])/(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]), x]
, x] /; FreeQ[{a, b, c, d, e, f, g, h, m}, x] && IntegerQ[2*m] && !LtQ[m,
-1]

```

Rule 1600

```

Int[(((a_.) + (b_.)*(x_))^(m_.)*((A_.) + (B_.)*(x_) + (C_.)*(x_)^2))/(Sqrt[
(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_S
ymbol] := Simp[(2*C*(a + b*x)^m*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/
(d*f*h*(2*m + 3)), x] + Dist[1/(d*f*h*(2*m + 3)), Int[((a + b*x)^(m - 1)/(S
qrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]))*Simp[a*A*d*f*h*(2*m + 3) - C*(a*
(d*e*g + c*f*g + c*e*h) + 2*b*c*e*g*m) + ((A*b + a*B)*d*f*h*(2*m + 3) - C*(
2*a*(d*f*g + d*e*h + c*f*h) + b*(2*m + 1)*(d*e*g + c*f*g + c*e*h))*x + (b*
B*d*f*h*(2*m + 3) + 2*C*(a*d*f*h*m - b*(m + 1)*(d*f*g + d*e*h + c*f*h)))*x^
2, x], x], x] /; FreeQ[{a, b, c, d, e, f, g, h, A, B, C}, x] && IntegerQ[2*
m] && GtQ[m, 0]

```

Rule 1615

```

Int[(Px_)*((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f
_.)*(x_))^(p_.), x_Symbol] := With[{q = Expon[Px, x], k = Coeff[Px, x, Expo
n[Px, x]]}, Simp[(k*(a + b*x)^(m + q - 1)*(c + d*x)^(n + 1)*(e + f*x)^(p +
1))/(d*f*b^(q - 1)*(m + n + p + q + 1)), x] + Dist[1/(d*f*b^q*(m + n + p +
q + 1)), Int[(a + b*x)^m*(c + d*x)^n*(e + f*x)^p*ExpandToSum[d*f*b^q*(m + n
+ p + q + 1)*Px - d*f*k*(m + n + p + q + 1)*(a + b*x)^q + k*(a + b*x)^(q -
2)*(a^2*d*f*(m + n + p + q + 1) - b*(b*c*e*(m + q - 1) + a*(d*e*(n + 1) +
c*f*(p + 1))) + b*(a*d*f*(2*(m + q) + n + p) - b*(d*e*(m + q + n) + c*f*(m
+ q + p)))*x), x], x], x] /; NeQ[m + n + p + q + 1, 0] /; FreeQ[{a, b, c,
d, e, f, m, n, p}, x] && PolyQ[Px, x] && IntegersQ[2*m, 2*n, 2*p]

```

Rule 158

```

Int[((g_.) + (h_.)*(x_))/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]*
Sqrt[(e_.) + (f_.)*(x_)]), x_Symbol] := Dist[h/f, Int[Sqrt[e + f*x]/(Sqrt[a
+ b*x]*Sqrt[c + d*x]), x], x] + Dist[(f*g - e*h)/f, Int[1/(Sqrt[a + b*x]*Sq
rt[c + d*x]*Sqrt[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x] &&
SimplerQ[a + b*x, e + f*x] && SimplerQ[c + d*x, e + f*x]

```

Rule 114

```

Int[Sqrt[(e_.) + (f_.)*(x_)]/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_
)]), x_Symbol] := Dist[(Sqrt[e + f*x]*Sqrt[(b*(c + d*x))/(b*c - a*d)]/(Sqr

```

```
t[c + d*x]*Sqrt[(b*(e + f*x))/(b*e - a*f)], Int[Sqrt[(b*e)/(b*e - a*f) + (
b*f*x)/(b*e - a*f)]/(Sqrt[a + b*x]*Sqrt[(b*c)/(b*c - a*d) + (b*d*x)/(b*c -
a*d)]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && !(GtQ[b/(b*c - a*d), 0]
&& GtQ[b/(b*e - a*f), 0]) && !LtQ[-((b*c - a*d)/d), 0]
```

Rule 113

```
Int[Sqrt[(e_.) + (f_.)*(x_)]/(Sqrt[(a_) + (b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_
)]), x_Symbol] := Simp[(2*Rt[-((b*e - a*f)/d), 2]*EllipticE[ArcSin[Sqrt[a +
b*x]/Rt[-((b*c - a*d)/d), 2]], (f*(b*c - a*d))/(d*(b*e - a*f))]/b, x] /;
FreeQ[{a, b, c, d, e, f}, x] && GtQ[b/(b*c - a*d), 0] && GtQ[b/(b*e - a*f),
0] && !LtQ[-((b*c - a*d)/d), 0] && !(SimplerQ[c + d*x, a + b*x] && GtQ[-
(d/(b*c - a*d)), 0] && GtQ[d/(d*e - c*f), 0] && !LtQ[(b*c - a*d)/b, 0])
```

Rule 121

```
Int[1/(Sqrt[(a_) + (b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x
_)]), x_Symbol] := Dist[Sqrt[(b*(c + d*x))/(b*c - a*d)]/Sqrt[c + d*x], Int[
1/(Sqrt[a + b*x]*Sqrt[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)]*Sqrt[e + f*x
]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && !GtQ[(b*c - a*d)/b, 0] && Si
mplerQ[a + b*x, c + d*x] && SimplerQ[a + b*x, e + f*x]
```

Rule 119

```
Int[1/(Sqrt[(a_) + (b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x
_)]), x_Symbol] := Simp[(2*Rt[-(b/d), 2]*EllipticF[ArcSin[Sqrt[a + b*x]/(Rt
[-(b/d), 2]*Sqrt[(b*c - a*d)/b])], (f*(b*c - a*d))/(d*(b*e - a*f))]/(b*Sqr
t[(b*e - a*f)/b]), x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[(b*c - a*d)/b,
0] && GtQ[(b*e - a*f)/b, 0] && PosQ[-(b/d)] && !(SimplerQ[c + d*x, a + b*
x] && GtQ[(d*e - c*f)/d, 0] && GtQ[-(d/b), 0]) && !(SimplerQ[c + d*x, a +
b*x] && GtQ[(-(b*e) + a*f)/f, 0] && GtQ[-(f/b), 0]) && !(SimplerQ[e + f*x,
a + b*x] && GtQ[(-(d*e) + c*f)/f, 0] && GtQ[(-(b*e) + a*f)/f, 0] && (PosQ[
-(f/d)] || PosQ[-(f/b)]))
```

Rubi steps

$$\begin{aligned}
\int \sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^3 dx &= \frac{2}{55} \sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^4 + \frac{1}{55} \int \frac{(7+5x)^3(-3-1190x+85x^2)}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}} dx \\
&= -\frac{427\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^3}{2970} + \frac{2}{55} \sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x} \left(\frac{17561\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^2}{8910} - \frac{427\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{2970} \right) \\
&= -\frac{12243139\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)}{356400} - \frac{17561\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{8910} \\
&= -\frac{1182926269\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{1603800} - \frac{12243139\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{356400} \\
&= -\frac{1182926269\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{1603800} - \frac{12243139\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{356400} \\
&= -\frac{1182926269\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{1603800} - \frac{12243139\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{356400} \\
&= -\frac{1182926269\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{1603800} - \frac{12243139\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{356400}
\end{aligned}$$

Mathematica [A] time = 0.416079, size = 135, normalized size = 0.48

$$\frac{57438413230\sqrt{66}\sqrt{5-2x}\text{EllipticF}\left(\sin^{-1}\left(\sqrt{\frac{3}{11}}\sqrt{4x+1}\right), \frac{1}{3}\right) + 24\sqrt{2-3x}\sqrt{4x+1}\left(29160000x^5 + 67338000x^4 - 167736600x^3 + 67338000x^2 - 29160000x + 2916000\right)}{15396480\sqrt{2}}$$

Antiderivative was successfully verified.

[In] Integrate[Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(7 + 5*x)^3, x]

[Out] (24*Sqrt[2 - 3*x]*Sqrt[1 + 4*x]*(3325071575 - 797747975*x - 670058262*x^2 - 167736600*x^3 + 67338000*x^4 + 29160000*x^5) - 71380354727*Sqrt[66]*Sqrt[5 - 2*x]*EllipticE[ArcSin[Sqrt[3/11]*Sqrt[1 + 4*x]], 1/3] + 57438413230*Sqrt[66]*Sqrt[5 - 2*x]*EllipticF[ArcSin[Sqrt[3/11]*Sqrt[1 + 4*x]], 1/3])/(15396480*Sqrt[-5 + 2*x])

Maple [A] time = 0.047, size = 160, normalized size = 0.6

$$\frac{1}{184757760x^3 - 538876800x^2 + 161663040x + 76982400} \sqrt{2-3x} \sqrt{2x-5} \sqrt{4x+1} \left(4199040000x^7 + 7947072000x^6 + \dots \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((7+5*x)^3*(2-3*x)^(1/2)*(2*x-5)^(1/2)*(4*x+1)^(1/2),x)

[Out] 1/7698240*(2-3*x)^(1/2)*(2*x-5)^(1/2)*(4*x+1)^(1/2)*(4199040000*x^7+7947072000*x^6+86157619845*11^(1/2)*(2-3*x)^(1/2)*(5-2*x)^(1/2)*(4*x+1)^(1/2)*EllipticF(2/11*(22-33*x)^(1/2),1/2*I*2^(1/2))-71380354727*11^(1/2)*(2-3*x)^(1/2)*(5-2*x)^(1/2)*(4*x+1)^(1/2)*EllipticE(2/11*(22-33*x)^(1/2),1/2*I*2^(1/2))-28894190400*x^5-88040305728*x^4-70646534280*x^3+542756583588*x^2-180358343100*x-79801717800)/(24*x^3-70*x^2+21*x+10)

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (5x+7)^3 \sqrt{4x+1} \sqrt{2x-5} \sqrt{-3x+2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((7+5*x)^3*(2-3*x)^(1/2)*(-5+2*x)^(1/2)*(1+4*x)^(1/2),x, algorithm="maxima")

[Out] integrate((5*x + 7)^3*sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2), x)

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\left(125x^3 + 525x^2 + 735x + 343\right)\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((7+5*x)^3*(2-3*x)^(1/2)*(-5+2*x)^(1/2)*(1+4*x)^(1/2),x, algorithm="fricas")

[Out] integral((125*x^3 + 525*x^2 + 735*x + 343)*sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2), x)

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((7+5*x)**3*(2-3*x)**(1/2)*(-5+2*x)**(1/2)*(1+4*x)**(1/2),x)

[Out] Timed out

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (5x + 7)^3 \sqrt{4x + 1} \sqrt{2x - 5} \sqrt{-3x + 2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((7+5*x)^3*(2-3*x)^(1/2)*(-5+2*x)^(1/2)*(1+4*x)^(1/2),x, algorithm="giac")

[Out] integrate((5*x + 7)^3*sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2), x)

3.36 $\int \sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^2 dx$

Optimal. Leaf size=243

$$\frac{5592499\sqrt{\frac{11}{6}}\sqrt{5-2x}\text{EllipticF}\left(\sin^{-1}\left(\sqrt{\frac{3}{11}}\sqrt{4x+1}\right), \frac{1}{3}\right)}{3888\sqrt{2x-5}} + \frac{2}{45}\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}(5x+7)^3 - \frac{61}{270}\sqrt{2-3x}\sqrt{2x-5}$$

[Out] (-5256763*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/97200 - (8141*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(7 + 5*x))/2700 - (61*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(7 + 5*x)^2)/270 + (2*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(7 + 5*x)^3)/45 - (17746949*Sqrt[11]*Sqrt[-5 + 2*x]*EllipticE[ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2])/(29160*Sqrt[5 - 2*x]) + (5592499*Sqrt[11/6]*Sqrt[5 - 2*x]*EllipticF[ArcSin[Sqrt[3/11]*Sqrt[1 + 4*x]], 1/3])/(3888*Sqrt[-5 + 2*x])

Rubi [A] time = 0.299877, antiderivative size = 243, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 8, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}} = 0.229$, Rules used = {161, 1600, 1615, 158, 114, 113, 121, 119}

$$\frac{2}{45}\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}(5x+7)^3 - \frac{61}{270}\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}(5x+7)^2 - \frac{8141\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}(5x+7)}{2700}$$

Antiderivative was successfully verified.

[In] Int[Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(7 + 5*x)^2,x]

[Out] (-5256763*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/97200 - (8141*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(7 + 5*x))/2700 - (61*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(7 + 5*x)^2)/270 + (2*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(7 + 5*x)^3)/45 - (17746949*Sqrt[11]*Sqrt[-5 + 2*x]*EllipticE[ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2])/(29160*Sqrt[5 - 2*x]) + (5592499*Sqrt[11/6]*Sqrt[5 - 2*x]*EllipticF[ArcSin[Sqrt[3/11]*Sqrt[1 + 4*x]], 1/3])/(3888*Sqrt[-5 + 2*x])

Rule 161

Int[((a_.) + (b_.)*(x_))^(m_)*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)], x_Symbol] := Simp[(2*(a + b*x)^(m + 1)*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(b*(2*m + 5)), x] + Dist[1/(b*(2*m + 5)), Int[((a + b*x)^m*Simp[3*b*c*e*g - a*(d*e*g + c*f*g + c*e*h) + 2*(b*(d

```
e*g + c*f*g + c*e*h) - a*(d*f*g + d*e*h + c*f*h))*x - (3*a*d*f*h - b*(d*f*g
+ d*e*h + c*f*h))*x^2, x)]/(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]), x]
, x] /; FreeQ[{a, b, c, d, e, f, g, h, m}, x] && IntegerQ[2*m] && !LtQ[m,
-1]
```

Rule 1600

```
Int[(((a_.) + (b_.)*(x_))^(m_.)*((A_.) + (B_.)*(x_) + (C_.)*(x_)^2))/(Sqrt[
(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_S
ymbol] :=> Simp[(2*C*(a + b*x)^m*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/
(d*f*h*(2*m + 3)), x] + Dist[1/(d*f*h*(2*m + 3)), Int[((a + b*x)^(m - 1)/(S
qrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]))*Simp[a*A*d*f*h*(2*m + 3) - C*(a*
(d*e*g + c*f*g + c*e*h) + 2*b*c*e*g*m) + ((A*b + a*B)*d*f*h*(2*m + 3) - C*(
2*a*(d*f*g + d*e*h + c*f*h) + b*(2*m + 1)*(d*e*g + c*f*g + c*e*h)))*x + (b*
B*d*f*h*(2*m + 3) + 2*C*(a*d*f*h*m - b*(m + 1)*(d*f*g + d*e*h + c*f*h)))*x^
2, x], x] /; FreeQ[{a, b, c, d, e, f, g, h, A, B, C}, x] && IntegerQ[2*
m] && GtQ[m, 0]
```

Rule 1615

```
Int[(Px_)*((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f
_.)*(x_))^(p_.), x_Symbol] :=> With[{q = Expon[Px, x], k = Coeff[Px, x, Expo
n[Px, x]]}, Simp[(k*(a + b*x)^(m + q - 1)*(c + d*x)^(n + 1)*(e + f*x)^(p +
1))/(d*f*b^(q - 1)*(m + n + p + q + 1)), x] + Dist[1/(d*f*b^q*(m + n + p +
q + 1)), Int[(a + b*x)^m*(c + d*x)^n*(e + f*x)^p*ExpandToSum[d*f*b^q*(m + n
+ p + q + 1)*Px - d*f*k*(m + n + p + q + 1)*(a + b*x)^q + k*(a + b*x)^(q -
2)*(a^2*d*f*(m + n + p + q + 1) - b*(b*c*e*(m + q - 1) + a*(d*e*(n + 1) +
c*f*(p + 1))) + b*(a*d*f*(2*(m + q) + n + p) - b*(d*e*(m + q + n) + c*f*(m
+ q + p)))*x), x], x] /; NeQ[m + n + p + q + 1, 0] /; FreeQ[{a, b, c,
d, e, f, m, n, p}, x] && PolyQ[Px, x] && IntegersQ[2*m, 2*n, 2*p]
```

Rule 158

```
Int[((g_.) + (h_.)*(x_))/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]*
Sqrt[(e_.) + (f_.)*(x_)]), x_Symbol] :=> Dist[h/f, Int[Sqrt[e + f*x]/(Sqrt[a
+ b*x]*Sqrt[c + d*x]), x], x] + Dist[(f*g - e*h)/f, Int[1/(Sqrt[a + b*x]*Sq
rt[c + d*x]*Sqrt[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x] &&
SimplerQ[a + b*x, e + f*x] && SimplerQ[c + d*x, e + f*x]
```

Rule 114

```
Int[Sqrt[(e_.) + (f_.)*(x_)]/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_
)]), x_Symbol] :=> Dist[(Sqrt[e + f*x]*Sqrt[(b*(c + d*x))/(b*c - a*d)])/Sqr
t[c + d*x]*Sqrt[(b*(e + f*x))/(b*e - a*f)], Int[Sqrt[(b*e)/(b*e - a*f) + (
b*f*x)/(b*e - a*f)]/(Sqrt[a + b*x]*Sqrt[(b*c)/(b*c - a*d) + (b*d*x)/(b*c -
```

```
a*d)]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && !(GtQ[b/(b*c - a*d), 0]
&& GtQ[b/(b*e - a*f), 0]) && !LtQ[-((b*c - a*d)/d), 0]
```

Rule 113

```
Int[Sqrt[(e_.) + (f_.)*(x_)]/(Sqrt[(a_) + (b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_
)]), x_Symbol] :> Simp[(2*Rt[-((b*e - a*f)/d), 2]*EllipticE[ArcSin[Sqrt[a +
b*x]/Rt[-((b*c - a*d)/d), 2]], (f*(b*c - a*d))/(d*(b*e - a*f))]/b, x] /;
FreeQ[{a, b, c, d, e, f}, x] && GtQ[b/(b*c - a*d), 0] && GtQ[b/(b*e - a*f),
0] && !LtQ[-((b*c - a*d)/d), 0] && !(SimplerQ[c + d*x, a + b*x] && GtQ[-
(d/(b*c - a*d)), 0] && GtQ[d/(d*e - c*f), 0] && !LtQ[(b*c - a*d)/b, 0])
```

Rule 121

```
Int[1/(Sqrt[(a_) + (b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x
_)]), x_Symbol] :> Dist[Sqrt[(b*(c + d*x))/(b*c - a*d)]/Sqrt[c + d*x], Int[
1/(Sqrt[a + b*x]*Sqrt[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)]*Sqrt[e + f*x
]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && !GtQ[(b*c - a*d)/b, 0] && Si
mplerQ[a + b*x, c + d*x] && SimplerQ[a + b*x, e + f*x]
```

Rule 119

```
Int[1/(Sqrt[(a_) + (b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x
_)]), x_Symbol] :> Simp[(2*Rt[-(b/d), 2]*EllipticF[ArcSin[Sqrt[a + b*x]/(Rt
[-(b/d), 2]*Sqrt[(b*c - a*d)/b])], (f*(b*c - a*d))/(d*(b*e - a*f))]/(b*Sqr
t[(b*e - a*f)/b]), x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[(b*c - a*d)/b,
0] && GtQ[(b*e - a*f)/b, 0] && PosQ[-(b/d)] && !(SimplerQ[c + d*x, a + b*
x] && GtQ[(d*e - c*f)/d, 0] && GtQ[-(d/b), 0]) && !(SimplerQ[c + d*x, a +
b*x] && GtQ[(-(b*e) + a*f)/f, 0] && GtQ[-(f/b), 0]) && !(SimplerQ[e + f*x,
a + b*x] && GtQ[(-(d*e) + c*f)/f, 0] && GtQ[(-(b*e) + a*f)/f, 0] && (PosQ[
-(f/d)] || PosQ[-(f/b)]))
```

Rubi steps

$$\begin{aligned}
\int \sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^2 dx &= \frac{2}{45} \sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^3 + \frac{1}{45} \int \frac{(7+5x)^2(-3-1190x+85x^2)}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}} dx \\
&= -\frac{61}{270} \sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^2 + \frac{2}{45} \sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x} \\
&= -\frac{8141\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)}{2700} - \frac{61}{270} \sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x} \\
&= -\frac{5256763\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{97200} - \frac{8141\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)}{2700} \\
&= -\frac{5256763\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{97200} - \frac{8141\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)}{2700} \\
&= -\frac{5256763\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{97200} - \frac{8141\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)}{2700} \\
&= -\frac{5256763\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{97200} - \frac{8141\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)}{2700}
\end{aligned}$$

Mathematica [A] time = 0.267728, size = 130, normalized size = 0.53

$$\frac{27962495\sqrt{66}\sqrt{5-2x}\text{EllipticF}\left(\sin^{-1}\left(\sqrt{\frac{3}{11}}\sqrt{4x+1}\right), \frac{1}{3}\right) + 6\sqrt{2-3x}\sqrt{4x+1}\left(216000x^4 + 147600x^3 - 1649952x^2 - 27962495\right)}{116640\sqrt{2x-5}}$$

Antiderivative was successfully verified.

[In] Integrate[Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(7 + 5*x)^2,x]

[Out] (6*Sqrt[2 - 3*x]*Sqrt[1 + 4*x]*(6902575 - 2933650*x - 1649952*x^2 + 147600*x^3 + 216000*x^4) - 35493898*Sqrt[66]*Sqrt[5 - 2*x]*EllipticE[ArcSin[Sqrt[3/11]*Sqrt[1 + 4*x]]], 1/3] + 27962495*Sqrt[66]*Sqrt[5 - 2*x]*EllipticF[ArcSin[Sqrt[3/11]*Sqrt[1 + 4*x]], 1/3])/(116640*Sqrt[-5 + 2*x])

Maple [A] time = 0.011, size = 155, normalized size = 0.6

$$\frac{1}{2799360x^3 - 8164800x^2 + 2449440x + 1166400} \sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1} \left(15552000x^6 + 83887485\sqrt{11}\sqrt{2-3x}\sqrt{5}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((7+5*x)^2*(2-3*x)^(1/2)*(2*x-5)^(1/2)*(4*x+1)^(1/2),x)
```

```
[Out] 1/116640*(2-3*x)^(1/2)*(2*x-5)^(1/2)*(4*x+1)^(1/2)*(15552000*x^6+83887485*1
1^(1/2)*(2-3*x)^(1/2)*(5-2*x)^(1/2)*(4*x+1)^(1/2)*EllipticF(2/11*(22-33*x)^(
1/2),1/2*I*2^(1/2))-70987796*11^(1/2)*(2-3*x)^(1/2)*(5-2*x)^(1/2)*(4*x+1)^(
1/2)*EllipticE(2/11*(22-33*x)^(1/2),1/2*I*2^(1/2))+4147200*x^5-125816544*x
^4-163495440*x^3+604794324*x^2-171873450*x-82830900)/(24*x^3-70*x^2+21*x+10
)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (5x + 7)^2 \sqrt{4x + 1} \sqrt{2x - 5} \sqrt{-3x + 2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((7+5*x)^2*(2-3*x)^(1/2)*(-5+2*x)^(1/2)*(1+4*x)^(1/2),x, algorithm
="maxima")
```

```
[Out] integrate((5*x + 7)^2*sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\left(25x^2 + 70x + 49\right)\sqrt{4x + 1}\sqrt{2x - 5}\sqrt{-3x + 2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((7+5*x)^2*(2-3*x)^(1/2)*(-5+2*x)^(1/2)*(1+4*x)^(1/2),x, algorithm
="fricas")
```

```
[Out] integral((25*x^2 + 70*x + 49)*sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2), x
)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((7+5*x)**2*(2-3*x)**(1/2)*(-5+2*x)**(1/2)*(1+4*x)**(1/2),x)`

[Out] Timed out

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (5x + 7)^2 \sqrt{4x + 1} \sqrt{2x - 5} \sqrt{-3x + 2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((7+5*x)^2*(2-3*x)^(1/2)*(-5+2*x)^(1/2)*(1+4*x)^(1/2),x, algorithm="giac")`

[Out] `integrate((5*x + 7)^2*sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2), x)`

3.37 $\int \sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x) dx$

Optimal. Leaf size=193

$$\frac{72479\sqrt{\frac{11}{6}}\sqrt{5-2x}\text{EllipticF}\left(\sin^{-1}\left(\sqrt{\frac{3}{11}}\sqrt{4x+1}\right), \frac{1}{3}\right)}{756\sqrt{2x-5}} + \frac{5}{28}\sqrt{2-3x}(2x-5)^{3/2}(4x+1)^{3/2} + \frac{136}{105}\sqrt{2-3x}\sqrt{2x-5}(4x+1)^{3/2}$$

[Out] (-20911*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/3780 + (136*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*(1 + 4*x)^(3/2))/105 + (5*Sqrt[2 - 3*x]*(-5 + 2*x)^(3/2)*(1 + 4*x)^(3/2))/28 - (954811*Sqrt[11]*Sqrt[-5 + 2*x]*EllipticE[ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2])/(22680*Sqrt[5 - 2*x]) + (72479*Sqrt[11/6]*Sqrt[5 - 2*x]*EllipticF[ArcSin[Sqrt[3/11]*Sqrt[1 + 4*x]], 1/3])/(756*Sqrt[-5 + 2*x])

Rubi [A] time = 0.0774144, antiderivative size = 193, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 6, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}} = 0.182$, Rules used = {154, 158, 114, 113, 121, 119}

$$\frac{5}{28}\sqrt{2-3x}(2x-5)^{3/2}(4x+1)^{3/2} + \frac{136}{105}\sqrt{2-3x}\sqrt{2x-5}(4x+1)^{3/2} - \frac{20911\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}}{3780} + \frac{72479\sqrt{\frac{11}{6}}\sqrt{5-2x}}{756\sqrt{2x-5}}$$

Antiderivative was successfully verified.

[In] Int[Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(7 + 5*x), x]

[Out] (-20911*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/3780 + (136*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*(1 + 4*x)^(3/2))/105 + (5*Sqrt[2 - 3*x]*(-5 + 2*x)^(3/2)*(1 + 4*x)^(3/2))/28 - (954811*Sqrt[11]*Sqrt[-5 + 2*x]*EllipticE[ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2])/(22680*Sqrt[5 - 2*x]) + (72479*Sqrt[11/6]*Sqrt[5 - 2*x]*EllipticF[ArcSin[Sqrt[3/11]*Sqrt[1 + 4*x]], 1/3])/(756*Sqrt[-5 + 2*x])

Rule 154

Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_)*((e_.) + (f_.)*(x_))^(p_)*((g_.) + (h_.)*(x_)), x_Symbol] := Simp[(h*(a + b*x)^m*(c + d*x)^(n+1)*(e + f*x)^(p+1))/(d*f*(m + n + p + 2)), x] + Dist[1/(d*f*(m + n + p + 2)), Int[(a + b*x)^(m-1)*(c + d*x)^n*(e + f*x)^p*Simp[a*d*f*g*(m + n + p + 2) - h*(b*c*e*m + a*(d*e*(n+1) + c*f*(p+1))) + (b*d*f*g*(m + n + p + 2) + h*(a*d*f*m - b*(d*e*(m + n + 1) + c*f*(m + p + 1)))]*x, x], x] /

; FreeQ[{a, b, c, d, e, f, g, h, n, p}, x] && GtQ[m, 0] && NeQ[m + n + p + 2, 0] && IntegersQ[2*m, 2*n, 2*p]

Rule 158

Int[((g_.) + (h_.)*(x_))/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]), x_Symbol] := Dist[h/f, Int[Sqrt[e + f*x]/(Sqrt[a + b*x]*Sqrt[c + d*x]), x], x] + Dist[(f*g - e*h)/f, Int[1/(Sqrt[a + b*x]*Sqrt[c + d*x]*Sqrt[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x] && SimplifierQ[a + b*x, e + f*x] && SimplifierQ[c + d*x, e + f*x]

Rule 114

Int[Sqrt[(e_.) + (f_.)*(x_)]/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]), x_Symbol] := Dist[(Sqrt[e + f*x]*Sqrt[(b*(c + d*x))/(b*c - a*d)])/(Sqrt[c + d*x]*Sqrt[(b*(e + f*x))/(b*e - a*f)]), Int[Sqrt[(b*e)/(b*e - a*f)] + (b*f*x)/(b*e - a*f)]/(Sqrt[a + b*x]*Sqrt[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && !(GtQ[b/(b*c - a*d), 0] && GtQ[b/(b*e - a*f), 0]) && !LtQ[-((b*c - a*d)/d), 0]

Rule 113

Int[Sqrt[(e_.) + (f_.)*(x_)]/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]), x_Symbol] := Simp[(2*Rt[-((b*e - a*f)/d), 2]*EllipticE[ArcSin[Sqrt[a + b*x]/Rt[-((b*c - a*d)/d), 2]], (f*(b*c - a*d))/(d*(b*e - a*f))]/b, x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[b/(b*c - a*d), 0] && GtQ[b/(b*e - a*f), 0] && !LtQ[-((b*c - a*d)/d), 0] && !(SimplerQ[c + d*x, a + b*x] && GtQ[-(d/(b*c - a*d)), 0] && GtQ[d/(d*e - c*f), 0] && !LtQ[(b*c - a*d)/b, 0])

Rule 121

Int[1/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]), x_Symbol] := Dist[Sqrt[(b*(c + d*x))/(b*c - a*d)]/Sqrt[c + d*x], Int[1/(Sqrt[a + b*x]*Sqrt[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)]*Sqrt[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && !GtQ[(b*c - a*d)/b, 0] && SimplifierQ[a + b*x, c + d*x] && SimplifierQ[a + b*x, e + f*x]

Rule 119

Int[1/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]), x_Symbol] := Simp[(2*Rt[-(b/d), 2]*EllipticF[ArcSin[Sqrt[a + b*x]/Rt[-(b/d), 2]*Sqrt[(b*c - a*d)/b]]], (f*(b*c - a*d))/(d*(b*e - a*f))]/(b*Sqrt[(b*e - a*f)/b]), x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[(b*c - a*d)/b, 0] && GtQ[(b*e - a*f)/b, 0] && PosQ[-(b/d)] && !(SimplerQ[c + d*x, a + b*x] && GtQ[(d*e - c*f)/d, 0] && GtQ[-(d/b), 0]) && !(SimplerQ[c + d*x, a +

```
b*x] && GtQ[(-(b*e) + a*f)/f, 0] && GtQ[-(f/b), 0]) && !(SimplerQ[e + f*x,
a + b*x] && GtQ[(-(d*e) + c*f)/f, 0] && GtQ[(-(b*e) + a*f)/f, 0] && (PosQ[
-(f/d)] || PosQ[-(f/b)]))
```

Rubi steps

$$\begin{aligned}
\int \sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x) dx &= \frac{5}{28}\sqrt{2-3x}(-5+2x)^{3/2}(1+4x)^{3/2} + \frac{1}{28} \int \frac{\left(\frac{1249}{2} - 1088x\right)\sqrt{-5+2x}\sqrt{1+4x}}{\sqrt{2-3x}} \\
&= \frac{136}{105}\sqrt{2-3x}\sqrt{-5+2x}(1+4x)^{3/2} + \frac{5}{28}\sqrt{2-3x}(-5+2x)^{3/2}(1+4x)^{3/2} - \frac{1}{840} \\
&= -\frac{20911\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{3780} + \frac{136}{105}\sqrt{2-3x}\sqrt{-5+2x}(1+4x)^{3/2} + \frac{5}{28} \\
&= -\frac{20911\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{3780} + \frac{136}{105}\sqrt{2-3x}\sqrt{-5+2x}(1+4x)^{3/2} + \frac{5}{28} \\
&= -\frac{20911\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{3780} + \frac{136}{105}\sqrt{2-3x}\sqrt{-5+2x}(1+4x)^{3/2} + \frac{5}{28} \\
&= -\frac{20911\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{3780} + \frac{136}{105}\sqrt{2-3x}\sqrt{-5+2x}(1+4x)^{3/2} + \frac{5}{28}
\end{aligned}$$

Mathematica [A] time = 0.232161, size = 125, normalized size = 0.65

$$\frac{724790\sqrt{66}\sqrt{5-2x}\text{EllipticF}\left(\sin^{-1}\left(\sqrt{\frac{3}{11}}\sqrt{4x+1}\right), \frac{1}{3}\right) + 24\sqrt{2-3x}\sqrt{4x+1}\left(5400x^3 - 6066x^2 - 37975x + 48475\right) - 9}{45360\sqrt{2x-5}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(7 + 5*x), x]
```

```
[Out] (24*Sqrt[2 - 3*x]*Sqrt[1 + 4*x]*(48475 - 37975*x - 6066*x^2 + 5400*x^3) - 9
54811*Sqrt[66]*Sqrt[5 - 2*x]*EllipticE[ArcSin[Sqrt[3/11]*Sqrt[1 + 4*x]], 1/
3] + 724790*Sqrt[66]*Sqrt[5 - 2*x]*EllipticF[ArcSin[Sqrt[3/11]*Sqrt[1 + 4*x
]], 1/3))/(45360*Sqrt[-5 + 2*x])
```

Maple [A] time = 0.012, size = 150, normalized size = 0.8

$$\frac{1}{544320x^3 - 1587600x^2 + 476280x + 226800} \sqrt{2-3x} \sqrt{2x-5} \sqrt{4x+1} \left(1087185 \sqrt{11} \sqrt{2-3x} \sqrt{5-2x} \sqrt{4x+1} \text{EllipticF} \left(\frac{2}{11} (22-33x)^{1/2}, \frac{1}{2} I^2 (2-3x)^{1/2} \right) - 954811 \sqrt{11} (2-3x)^{1/2} (5-2x)^{1/2} (4x+1)^{1/2} \text{EllipticE} \left(\frac{2}{11} (22-33x)^{1/2}, \frac{1}{2} I^2 (2-3x)^{1/2} \right) + 777600x^5 - 1197504x^4 - 5234040x^3 + 9404484x^2 - 1997100x - 1163400 \right) / (24x^3 - 70x^2 + 21x + 10)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((7+5*x)*(2-3*x)^(1/2)*(2*x-5)^(1/2)*(4*x+1)^(1/2),x)

[Out] 1/22680*(2-3*x)^(1/2)*(2*x-5)^(1/2)*(4*x+1)^(1/2)*(1087185*11^(1/2)*(2-3*x)^(1/2)*(5-2*x)^(1/2)*(4*x+1)^(1/2)*EllipticF(2/11*(22-33*x)^(1/2),1/2*I^2^(1/2))-954811*11^(1/2)*(2-3*x)^(1/2)*(5-2*x)^(1/2)*(4*x+1)^(1/2)*EllipticE(2/11*(22-33*x)^(1/2),1/2*I^2^(1/2))+777600*x^5-1197504*x^4-5234040*x^3+9404484*x^2-1997100*x-1163400)/(24*x^3-70*x^2+21*x+10)

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (5x + 7) \sqrt{4x + 1} \sqrt{2x - 5} \sqrt{-3x + 2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((7+5*x)*(2-3*x)^(1/2)*(-5+2*x)^(1/2)*(1+4*x)^(1/2),x, algorithm="maxima")

[Out] integrate((5*x + 7)*sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2), x)

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral} \left((5x + 7) \sqrt{4x + 1} \sqrt{2x - 5} \sqrt{-3x + 2}, x \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((7+5*x)*(2-3*x)^(1/2)*(-5+2*x)^(1/2)*(1+4*x)^(1/2),x, algorithm="fricas")

[Out] integral((5*x + 7)*sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2), x)

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((7+5*x)*(2-3*x)**(1/2)*(-5+2*x)**(1/2)*(1+4*x)**(1/2), x)

[Out] Timed out

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (5x + 7)\sqrt{4x + 1}\sqrt{2x - 5}\sqrt{-3x + 2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((7+5*x)*(2-3*x)^(1/2)*(-5+2*x)^(1/2)*(1+4*x)^(1/2), x, algorithm="giac")

[Out] integrate((5*x + 7)*sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2), x)

3.38 $\int \sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x} dx$

Optimal. Leaf size=162

$$\frac{121\sqrt{\frac{11}{6}}\sqrt{5-2x}\text{EllipticF}\left(\sin^{-1}\left(\sqrt{\frac{3}{11}}\sqrt{4x+1}\right), \frac{1}{3}\right)}{18\sqrt{2x-5}} + \frac{1}{10}\sqrt{2-3x}\sqrt{2x-5}(4x+1)^{3/2} - \frac{22}{45}\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1} - \frac{847\sqrt{11}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{18\sqrt{2x-5}}$$

[Out] $(-22*\text{Sqrt}[2 - 3*x]*\text{Sqrt}[-5 + 2*x]*\text{Sqrt}[1 + 4*x])/45 + (\text{Sqrt}[2 - 3*x]*\text{Sqrt}[-5 + 2*x]*(1 + 4*x)^{(3/2)})/10 - (847*\text{Sqrt}[11]*\text{Sqrt}[-5 + 2*x]*\text{EllipticE}[\text{ArcSin}[(2*\text{Sqrt}[2 - 3*x])/ \text{Sqrt}[11]], -1/2])/(270*\text{Sqrt}[5 - 2*x]) + (121*\text{Sqrt}[11/6]*\text{Sqrt}[5 - 2*x]*\text{EllipticF}[\text{ArcSin}[\text{Sqrt}[3/11]*\text{Sqrt}[1 + 4*x]], 1/3])/(18*\text{Sqrt}[-5 + 2*x])$

Rubi [A] time = 0.0627527, antiderivative size = 162, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}} = 0.25$, Rules used = {101, 154, 158, 114, 113, 121, 119}

$$\frac{1}{10}\sqrt{2-3x}\sqrt{2x-5}(4x+1)^{3/2} - \frac{22}{45}\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1} + \frac{121\sqrt{\frac{11}{6}}\sqrt{5-2x}\text{F}\left(\sin^{-1}\left(\sqrt{\frac{3}{11}}\sqrt{4x+1}\right)\middle|\frac{1}{3}\right)}{18\sqrt{2x-5}} - \frac{847\sqrt{11}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{18\sqrt{2x-5}}$$

Antiderivative was successfully verified.

[In] $\text{Int}[\text{Sqrt}[2 - 3*x]*\text{Sqrt}[-5 + 2*x]*\text{Sqrt}[1 + 4*x], x]$

[Out] $(-22*\text{Sqrt}[2 - 3*x]*\text{Sqrt}[-5 + 2*x]*\text{Sqrt}[1 + 4*x])/45 + (\text{Sqrt}[2 - 3*x]*\text{Sqrt}[-5 + 2*x]*(1 + 4*x)^{(3/2)})/10 - (847*\text{Sqrt}[11]*\text{Sqrt}[-5 + 2*x]*\text{EllipticE}[\text{ArcSin}[(2*\text{Sqrt}[2 - 3*x])/ \text{Sqrt}[11]], -1/2])/(270*\text{Sqrt}[5 - 2*x]) + (121*\text{Sqrt}[11/6]*\text{Sqrt}[5 - 2*x]*\text{EllipticF}[\text{ArcSin}[\text{Sqrt}[3/11]*\text{Sqrt}[1 + 4*x]], 1/3])/(18*\text{Sqrt}[-5 + 2*x])$

Rule 101

$\text{Int}[(a + b*x)^m * (c + d*x)^n * (e + f*x)^p, x] \rightarrow \text{Simp}[(a + b*x)^m * (c + d*x)^n * (e + f*x)^{p+1} / (f * (m + n + p + 1)), x] - \text{Dist}[1 / (f * (m + n + p + 1)), \text{Int}[(a + b*x)^{m-1} * (c + d*x)^n * (e + f*x)^p * \text{Simp}[c*m*(b*e - a*f) + a*n*(d*e - c*f) + (d*m*(b*e - a*f) + b*n*(d*e - c*f))*x, x], x] /;$ $\text{FreeQ}\{a, b, c, d, e, f, p\}, x \ \&\& \ \text{GtQ}[m, 0] \ \&\& \ \text{GtQ}[n, 0] \ \&\& \ \text{NeQ}[m + n + p + 1, 0] \ \&\& \ (\text{IntegersQ}[2*m, 2*n, 2*p] \ || \ (\text{IntegersQ}[m, n + p] \ || \ \text{IntegersQ}[p, m + n]))$

Rule 154

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_)*((e_.) + (f_.)*(x_))^(p_)*((g_.) + (h_.)*(x_)), x_Symbol] := Simp[(h*(a + b*x)^m*(c + d*x)^(n + 1)*(e + f*x)^(p + 1))/(d*f*(m + n + p + 2)), x] + Dist[1/(d*f*(m + n + p + 2)), Int[(a + b*x)^(m - 1)*(c + d*x)^n*(e + f*x)^p*Simp[a*d*f*g*(m + n + p + 2) - h*(b*c*e*m + a*(d*e*(n + 1) + c*f*(p + 1))) + (b*d*f*g*(m + n + p + 2) + h*(a*d*f*m - b*(d*e*(m + n + 1) + c*f*(m + p + 1)))]*x, x], x] / ; FreeQ[{a, b, c, d, e, f, g, h, n, p}, x] && GtQ[m, 0] && NeQ[m + n + p + 2, 0] && IntegersQ[2*m, 2*n, 2*p]
```

Rule 158

```
Int[((g_.) + (h_.)*(x_))/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]), x_Symbol] := Dist[h/f, Int[Sqrt[e + f*x]/(Sqrt[a + b*x]*Sqrt[c + d*x]), x], x] + Dist[(f*g - e*h)/f, Int[1/(Sqrt[a + b*x]*Sqrt[c + d*x]*Sqrt[e + f*x]), x], x] / ; FreeQ[{a, b, c, d, e, f, g, h}, x] && SimplifierQ[a + b*x, e + f*x] && SimplifierQ[c + d*x, e + f*x]
```

Rule 114

```
Int[Sqrt[(e_.) + (f_.)*(x_)]/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]), x_Symbol] := Dist[(Sqrt[e + f*x]*Sqrt[(b*(c + d*x))/(b*c - a*d)])/(Sqrt[c + d*x]*Sqrt[(b*(e + f*x))/(b*e - a*f)]), Int[Sqrt[(b*e)/(b*e - a*f) + (b*f*x)/(b*e - a*f)]/(Sqrt[a + b*x]*Sqrt[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)]), x], x] / ; FreeQ[{a, b, c, d, e, f}, x] && !(GtQ[b/(b*c - a*d), 0] && GtQ[b/(b*e - a*f), 0]) && !LtQ[-((b*c - a*d)/d), 0]
```

Rule 113

```
Int[Sqrt[(e_.) + (f_.)*(x_)]/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]), x_Symbol] := Simp[(2*Rt[-((b*e - a*f)/d), 2]*EllipticE[ArcSin[Sqrt[a + b*x]/Rt[-((b*c - a*d)/d), 2]], (f*(b*c - a*d))/(d*(b*e - a*f))]/b, x] / ; FreeQ[{a, b, c, d, e, f}, x] && GtQ[b/(b*c - a*d), 0] && GtQ[b/(b*e - a*f), 0] && !LtQ[-((b*c - a*d)/d), 0] && !(SimplerQ[c + d*x, a + b*x] && GtQ[-(d/(b*c - a*d)), 0] && GtQ[d/(d*e - c*f), 0] && !LtQ[(b*c - a*d)/b, 0])
```

Rule 121

```
Int[1/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]), x_Symbol] := Dist[Sqrt[(b*(c + d*x))/(b*c - a*d)]/Sqrt[c + d*x], Int[1/(Sqrt[a + b*x]*Sqrt[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)]*Sqrt[e + f*x]), x], x] / ; FreeQ[{a, b, c, d, e, f}, x] && !GtQ[(b*c - a*d)/b, 0] && SimplifierQ[a + b*x, c + d*x] && SimplifierQ[a + b*x, e + f*x]
```


Rule 119

```
Int[1/(Sqrt[(a_) + (b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x_)]), x_Symbol] :> Simp[(2*Rt[-(b/d), 2]*EllipticF[ArcSin[Sqrt[a + b*x]/(Rt[-(b/d), 2]*Sqrt[(b*c - a*d)/b])], (f*(b*c - a*d))/(d*(b*e - a*f)))]/(b*Sqrt[(b*e - a*f)/b]), x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[(b*c - a*d)/b, 0] && GtQ[(b*e - a*f)/b, 0] && PosQ[-(b/d)] && !(SimplerQ[c + d*x, a + b*x] && GtQ[(d*e - c*f)/d, 0] && GtQ[-(d/b), 0]) && !(SimplerQ[c + d*x, a + b*x] && GtQ[-(b*e) + a*f, f, 0] && GtQ[-(f/b), 0]) && !(SimplerQ[e + f*x, a + b*x] && GtQ[-(d*e) + c*f, f, 0] && GtQ[-(b*e) + a*f, f, 0] && (PosQ[-(f/d)] || PosQ[-(f/b)]))
```

Rubi steps

$$\begin{aligned}
\int \sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x} dx &= \frac{1}{10}\sqrt{2-3x}\sqrt{-5+2x}(1+4x)^{3/2} - \frac{1}{10} \int \frac{\left(\frac{99}{2} - 44x\right)\sqrt{1+4x}}{\sqrt{2-3x}\sqrt{-5+2x}} dx \\
&= -\frac{22}{45}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x} + \frac{1}{10}\sqrt{2-3x}\sqrt{-5+2x}(1+4x)^{3/2} + \frac{1}{90} \int \frac{-18}{\sqrt{2-3x}\sqrt{-5+2x}} dx \\
&= -\frac{22}{45}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x} + \frac{1}{10}\sqrt{2-3x}\sqrt{-5+2x}(1+4x)^{3/2} + \frac{847}{90} \int \frac{\sqrt{-5}}{\sqrt{2-3x}\sqrt{-5+2x}} dx \\
&= -\frac{22}{45}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x} + \frac{1}{10}\sqrt{2-3x}\sqrt{-5+2x}(1+4x)^{3/2} + \frac{\left(121\sqrt{\frac{11}{2}}\sqrt{5-2x}\right)}{1} \\
&= -\frac{22}{45}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x} + \frac{1}{10}\sqrt{2-3x}\sqrt{-5+2x}(1+4x)^{3/2} - \frac{847\sqrt{11}\sqrt{-5+2x}}{2}
\end{aligned}$$

Mathematica [A] time = 0.170029, size = 120, normalized size = 0.74

$$\frac{605\sqrt{66}\sqrt{5-2x}\text{EllipticF}\left(\sin^{-1}\left(\sqrt{\frac{3}{11}}\sqrt{4x+1}\right), \frac{1}{3}\right) + 6\sqrt{2-3x}\sqrt{4x+1}(72x^2 - 250x + 175) - 847\sqrt{66}\sqrt{5-2x}E\left(\sin^{-1}\left(\sqrt{\frac{3}{11}}\sqrt{4x+1}\right), \frac{1}{3}\right)}{540\sqrt{2x-5}}$$

Antiderivative was successfully verified.

[In] Integrate[Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x], x]

[Out] (6*Sqrt[2 - 3*x]*Sqrt[1 + 4*x]*(175 - 250*x + 72*x^2) - 847*Sqrt[66]*Sqrt[5 - 2*x]*EllipticE[ArcSin[Sqrt[3/11]*Sqrt[1 + 4*x]], 1/3] + 605*Sqrt[66]*Sqr

$t[5 - 2*x]*\text{EllipticF}[\text{ArcSin}[\text{Sqrt}[3/11]*\text{Sqrt}[1 + 4*x]], 1/3]/(540*\text{Sqrt}[-5 + 2*x])$

Maple [A] time = 0.008, size = 145, normalized size = 0.9

$$\frac{1}{12960x^3 - 37800x^2 + 11340x + 5400} \sqrt{2-3x} \sqrt{2x-5} \sqrt{4x+1} \left(1815 \sqrt{11} \sqrt{2-3x} \sqrt{5-2x} \sqrt{4x+1} \text{EllipticF}\left(\frac{2}{11} \sqrt{2-3x} \right) - 1694 \sqrt{11} \sqrt{2-3x} \sqrt{5-2x} \sqrt{4x+1} \text{EllipticE}\left(\frac{2}{11} \sqrt{2-3x} \right) + 5184x^4 - 20160x^3 + 19236x^2 - 2250x - 2100 \right) / (24x^3 - 70x^2 + 21x + 10)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `int((2-3*x)^(1/2)*(2*x-5)^(1/2)*(4*x+1)^(1/2),x)`

[Out] `1/540*(2-3*x)^(1/2)*(2*x-5)^(1/2)*(4*x+1)^(1/2)*(1815*11^(1/2)*(2-3*x)^(1/2)*(5-2*x)^(1/2)*(4*x+1)^(1/2)*EllipticF(2/11*(22-33*x)^(1/2),1/2*I*2^(1/2))-1694*11^(1/2)*(2-3*x)^(1/2)*(5-2*x)^(1/2)*(4*x+1)^(1/2)*EllipticE(2/11*(22-33*x)^(1/2),1/2*I*2^(1/2))+5184*x^4-20160*x^3+19236*x^2-2250*x-2100)/(24*x^3-70*x^2+21*x+10)`

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{4x+1} \sqrt{2x-5} \sqrt{-3x+2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((2-3*x)^(1/2)*(-5+2*x)^(1/2)*(1+4*x)^(1/2),x, algorithm="maxima")`

[Out] `integrate(sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2), x)`

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\sqrt{4x+1} \sqrt{2x-5} \sqrt{-3x+2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((2-3*x)^(1/2)*(-5+2*x)^(1/2)*(1+4*x)^(1/2),x, algorithm="fricas")`

[Out] `integral(sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2), x)`

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((2-3*x)**(1/2)*(-5+2*x)**(1/2)*(1+4*x)**(1/2), x)`

[Out] `Integral(sqrt(2 - 3*x)*sqrt(2*x - 5)*sqrt(4*x + 1), x)`

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((2-3*x)^(1/2)*(-5+2*x)^(1/2)*(1+4*x)^(1/2), x, algorithm="giac")`

[Out] `integrate(sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2), x)`

$$3.39 \quad \int \frac{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{7+5x} dx$$

Optimal. Leaf size=182

$$\frac{1253\sqrt{\frac{2}{33}}\sqrt{5-2x}\text{EllipticF}\left(\sin^{-1}\left(\sqrt{\frac{3}{11}}\sqrt{4x+1}\right), \frac{1}{3}\right)}{375\sqrt{2x-5}} + \frac{2}{15}\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1} - \frac{427\sqrt{11}\sqrt{2x-5}E\left(\sin^{-1}\left(\frac{2\sqrt{2-3x}}{\sqrt{11}}\right)\right)}{225\sqrt{5-2x}}$$

[Out] (2*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/15 - (427*Sqrt[11]*Sqrt[-5 + 2*x]*EllipticE[ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2])/(225*Sqrt[5 - 2*x]) - (1253*Sqrt[2/33]*Sqrt[5 - 2*x]*EllipticF[ArcSin[Sqrt[3/11]*Sqrt[1 + 4*x]], 1/3])/(375*Sqrt[-5 + 2*x]) - (2691*Sqrt[5 - 2*x]*EllipticPi[55/124, ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2])/(125*Sqrt[11]*Sqrt[-5 + 2*x])

Rubi [A] time = 0.212519, antiderivative size = 182, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 10, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}} = 0.286$, Rules used = {161, 1607, 168, 538, 537, 158, 114, 113, 121, 119}

$$\frac{2}{15}\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1} - \frac{1253\sqrt{\frac{2}{33}}\sqrt{5-2x}F\left(\sin^{-1}\left(\sqrt{\frac{3}{11}}\sqrt{4x+1}\right)\middle|\frac{1}{3}\right)}{375\sqrt{2x-5}} - \frac{427\sqrt{11}\sqrt{2x-5}E\left(\sin^{-1}\left(\frac{2\sqrt{2-3x}}{\sqrt{11}}\right)\middle|\frac{1}{2}\right)}{225\sqrt{5-2x}}$$

Antiderivative was successfully verified.

[In] Int[(Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/(7 + 5*x), x]

[Out] (2*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/15 - (427*Sqrt[11]*Sqrt[-5 + 2*x]*EllipticE[ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2])/(225*Sqrt[5 - 2*x]) - (1253*Sqrt[2/33]*Sqrt[5 - 2*x]*EllipticF[ArcSin[Sqrt[3/11]*Sqrt[1 + 4*x]], 1/3])/(375*Sqrt[-5 + 2*x]) - (2691*Sqrt[5 - 2*x]*EllipticPi[55/124, ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2])/(125*Sqrt[11]*Sqrt[-5 + 2*x])

Rule 161

Int[((a_.) + (b_.)*(x_))^(m_)*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)], x_Symbol] := Simp[(2*(a + b*x)^(m + 1)*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(b*(2*m + 5)), x] + Dist[1/(b*(2*m + 5)), Int[((a + b*x)^m*Simp[3*b*c*e*g - a*(d*e*g + c*f*g + c*e*h) + 2*(b*(d*e*g + c*f*g + c*e*h) - a*(d*f*g + d*e*h + c*f*h))*x - (3*a*d*f*h - b*(d*f*g + d*e*h + c*f*h))*x^2, x])/(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]), x] /; FreeQ[{a, b, c, d, e, f, g, h, m}, x] && IntegerQ[2*m] && !LtQ[m,

-1]

Rule 1607

```
Int[(Px_)*((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p_.)*((g_.) + (h_.)*(x_))^(q_.), x_Symbol] := Dist[PolynomialRema
inder[Px, a + b*x, x], Int[(a + b*x)^m*(c + d*x)^n*(e + f*x)^p*(g + h*x)^q
, x], x] + Int[PolynomialQuotient[Px, a + b*x, x]*(a + b*x)^(m + 1)*(c + d*
x)^n*(e + f*x)^p*(g + h*x)^q, x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n, p,
q}, x] && PolyQ[Px, x] && EqQ[m, -1]
```

Rule 168

```
Int[1/(((a_.) + (b_.)*(x_))*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_
)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Dist[-2, Subst[Int[1/(Simp[b*c -
a*d - b*x^2, x]*Sqrt[Simp[(d*e - c*f)/d + (f*x^2)/d, x]]*Sqrt[Simp[(d*g -
c*h)/d + (h*x^2)/d, x]]], x], x, Sqrt[c + d*x]], x] /; FreeQ[{a, b, c, d, e
, f, g, h}, x] && GtQ[(d*e - c*f)/d, 0]
```

Rule 538

```
Int[1/(((a_) + (b_.)*(x_)^2)*Sqrt[(c_) + (d_.)*(x_)^2]*Sqrt[(e_) + (f_.)*(x
_)^2]), x_Symbol] := Dist[Sqrt[1 + (d*x^2)/c]/Sqrt[c + d*x^2], Int[1/((a +
b*x^2)*Sqrt[1 + (d*x^2)/c]*Sqrt[e + f*x^2]), x], x] /; FreeQ[{a, b, c, d, e
, f}, x] && !GtQ[c, 0]
```

Rule 537

```
Int[1/(((a_) + (b_.)*(x_)^2)*Sqrt[(c_) + (d_.)*(x_)^2]*Sqrt[(e_) + (f_.)*(x
_)^2]), x_Symbol] := Simp[(1*EllipticPi[(b*c)/(a*d), ArcSin[Rt[-(d/c), 2]*x
], (c*f)/(d*e)])/(a*Sqrt[c]*Sqrt[e]*Rt[-(d/c), 2]), x] /; FreeQ[{a, b, c, d
, e, f}, x] && !GtQ[d/c, 0] && GtQ[c, 0] && GtQ[e, 0] && !( !GtQ[f/e, 0]
&& SimplerSqrtQ[-(f/e), -(d/c)])
```

Rule 158

```
Int[((g_.) + (h_.)*(x_))/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*
Sqrt[(e_) + (f_.)*(x_)]), x_Symbol] := Dist[h/f, Int[Sqrt[e + f*x]/(Sqrt[a
+ b*x]*Sqrt[c + d*x]), x], x] + Dist[(f*g - e*h)/f, Int[1/(Sqrt[a + b*x]*Sq
rt[c + d*x]*Sqrt[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x] &&
SimplerQ[a + b*x, e + f*x] && SimplerQ[c + d*x, e + f*x]
```

Rule 114

```
Int[Sqrt[(e_.) + (f_.)*(x_)]/(Sqrt[(a_) + (b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]), x_Symbol] := Dist[(Sqrt[e + f*x]*Sqrt[(b*(c + d*x))/(b*c - a*d)])/(Sqrt[c + d*x]*Sqrt[(b*(e + f*x))/(b*e - a*f)])], Int[Sqrt[(b*e)/(b*e - a*f) + (b*f*x)/(b*e - a*f)]/(Sqrt[a + b*x]*Sqrt[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)])], x], x] /; FreeQ[{a, b, c, d, e, f}, x] && !(GtQ[b/(b*c - a*d), 0] && GtQ[b/(b*e - a*f), 0]) && !LtQ[-((b*c - a*d)/d), 0]
```

Rule 113

```
Int[Sqrt[(e_.) + (f_.)*(x_)]/(Sqrt[(a_) + (b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]), x_Symbol] := Simp[(2*Rt[-((b*e - a*f)/d), 2]*EllipticE[ArcSin[Sqrt[a + b*x]/Rt[-((b*c - a*d)/d), 2]], (f*(b*c - a*d))/(d*(b*e - a*f))]/b, x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[b/(b*c - a*d), 0] && GtQ[b/(b*e - a*f), 0] && !LtQ[-((b*c - a*d)/d), 0] && !(SimplerQ[c + d*x, a + b*x] && GtQ[-(d/(b*c - a*d)), 0] && GtQ[d/(d*e - c*f), 0] && !LtQ[(b*c - a*d)/b, 0])
```

Rule 121

```
Int[1/(Sqrt[(a_) + (b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x_)]), x_Symbol] := Dist[Sqrt[(b*(c + d*x))/(b*c - a*d)]/Sqrt[c + d*x], Int[1/(Sqrt[a + b*x]*Sqrt[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)]*Sqrt[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && !GtQ[(b*c - a*d)/b, 0] && SimplerQ[a + b*x, c + d*x] && SimplerQ[a + b*x, e + f*x]
```

Rule 119

```
Int[1/(Sqrt[(a_) + (b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x_)]), x_Symbol] := Simp[(2*Rt[-(b/d), 2]*EllipticF[ArcSin[Sqrt[a + b*x]/Rt[-(b/d), 2]*Sqrt[(b*c - a*d)/b]]], (f*(b*c - a*d))/(d*(b*e - a*f))]/(b*Sqrt[(b*e - a*f)/b]), x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[(b*c - a*d)/b, 0] && GtQ[(b*e - a*f)/b, 0] && PosQ[-(b/d)] && !(SimplerQ[c + d*x, a + b*x] && GtQ[(d*e - c*f)/d, 0] && GtQ[-(d/b), 0]) && !(SimplerQ[c + d*x, a + b*x] && GtQ[-(b*e) + a*f, f, 0] && GtQ[-(f/b), 0]) && !(SimplerQ[e + f*x, a + b*x] && GtQ[-(d*e) + c*f, f, 0] && GtQ[-(b*e) + a*f, f, 0] && (PosQ[-(f/d)] || PosQ[-(f/b)]))
```

Rubi steps

$$\begin{aligned}
\int \frac{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{7+5x} dx &= \frac{2}{15}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x} + \frac{1}{15} \int \frac{-3-1190x+854x^2}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)} dx \\
&= \frac{2}{15}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x} + \frac{1}{15} \int \frac{-\frac{11928}{25} + \frac{854x}{5}}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}} dx + \frac{27807}{125} \int \frac{1}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}} dx \\
&= \frac{2}{15}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x} - \frac{1253}{375} \int \frac{1}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}} dx + \frac{427}{75} \int \frac{1}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}} dx \\
&= \frac{2}{15}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x} - \frac{\left(1253\sqrt{\frac{2}{11}}\sqrt{5-2x}\right) \int \frac{1}{\sqrt{2-3x}\sqrt{\frac{10}{11}-\frac{4x}{11}}\sqrt{1+4x}} dx}{375\sqrt{-5+2x}} \quad (556) \\
&= \frac{2}{15}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x} - \frac{427\sqrt{11}\sqrt{-5+2x}E\left(\sin^{-1}\left(\frac{2\sqrt{2-3x}}{\sqrt{11}}\right)\middle|-\frac{1}{2}\right) - 1253\sqrt{5-2x}}{225\sqrt{5-2x}}
\end{aligned}$$

Mathematica [A] time = 0.765967, size = 141, normalized size = 0.77

$$\frac{\sqrt{2x-5}\left(-3759\sqrt{11}\text{EllipticF}\left(\sin^{-1}\left(\frac{2\sqrt{2-3x}}{\sqrt{11}}\right),-\frac{1}{2}\right)+1650\sqrt{2-3x}\sqrt{5-2x}\sqrt{4x+1}-23485\sqrt{11}E\left(\sin^{-1}\left(\frac{2\sqrt{2-3x}}{\sqrt{11}}\right)\middle|-\frac{1}{2}\right)\right)}{12375\sqrt{5-2x}}$$

Antiderivative was successfully verified.

[In] Integrate[(Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/(7 + 5*x),x]

[Out] (Sqrt[-5 + 2*x]*(1650*Sqrt[2 - 3*x]*Sqrt[5 - 2*x]*Sqrt[1 + 4*x] - 23485*Sqrt[11]*EllipticE[ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2] - 3759*Sqrt[11]*EllipticF[ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2] - 24219*Sqrt[11]*EllipticPi[55/124, -ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2]))/(12375*Sqrt[5 - 2*x])

Maple [A] time = 0.02, size = 183, normalized size = 1.

$$-\frac{1}{297000x^3 - 866250x^2 + 259875x + 123750}\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}\left(3759\sqrt{11}\sqrt{2-3x}\sqrt{5-2x}\sqrt{4x+1}\text{EllipticF}\left(\sin^{-1}\left(\frac{2\sqrt{2-3x}}{\sqrt{11}}\right),-\frac{1}{2}\right)+1650\sqrt{2-3x}\sqrt{5-2x}\sqrt{4x+1}-23485\sqrt{11}E\left(\sin^{-1}\left(\frac{2\sqrt{2-3x}}{\sqrt{11}}\right)\middle|-\frac{1}{2}\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `int((2-3*x)^(1/2)*(2*x-5)^(1/2)*(4*x+1)^(1/2)/(7+5*x),x)`

[Out]
$$-1/12375*(2-3*x)^{(1/2)}*(2*x-5)^{(1/2)}*(4*x+1)^{(1/2)}*(3759*11^{(1/2)}*(2-3*x)^{(1/2)}*(5-2*x)^{(1/2)}*(4*x+1)^{(1/2)}*\text{EllipticF}(2/11*(22-33*x)^{(1/2)},1/2*I*2^{(1/2)})+23485*11^{(1/2)}*(2-3*x)^{(1/2)}*(5-2*x)^{(1/2)}*(4*x+1)^{(1/2)}*\text{EllipticE}(2/11*(22-33*x)^{(1/2)},1/2*I*2^{(1/2)})-24219*11^{(1/2)}*(2-3*x)^{(1/2)}*(5-2*x)^{(1/2)}*(4*x+1)^{(1/2)}*\text{EllipticPi}(2/11*(22-33*x)^{(1/2)},55/124,1/2*I*2^{(1/2)})-39600*x^3+115500*x^2-34650*x-16500)/(24*x^3-70*x^2+21*x+10)$$

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2}}{5x+7} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((2-3*x)^(1/2)*(-5+2*x)^(1/2)*(1+4*x)^(1/2)/(7+5*x),x, algorithm="maxima")`

[Out] `integrate(sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)/(5*x + 7), x)`

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2}}{5x+7},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((2-3*x)^(1/2)*(-5+2*x)^(1/2)*(1+4*x)^(1/2)/(7+5*x),x, algorithm="fricas")`

[Out] `integral(sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)/(5*x + 7), x)`

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}}{5x+7} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((2-3*x)**(1/2)*(-5+2*x)**(1/2)*(1+4*x)**(1/2)/(7+5*x),x)`

[Out] `Integral(sqrt(2 - 3*x)*sqrt(2*x - 5)*sqrt(4*x + 1)/(5*x + 7), x)`

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2}}{5x+7} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((2-3*x)^(1/2)*(-5+2*x)^(1/2)*(1+4*x)^(1/2)/(7+5*x),x, algorithm="giac")`

[Out] `integrate(sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)/(5*x + 7), x)`

$$3.40 \quad \int \frac{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{(7+5x)^2} dx$$

Optimal. Leaf size=189

$$\frac{152\sqrt{\frac{2}{33}}\sqrt{5-2x}\text{EllipticF}\left(\sin^{-1}\left(\sqrt{\frac{3}{11}}\sqrt{4x+1}\right), \frac{1}{3}\right)}{125\sqrt{2x-5}} - \frac{\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}}{5(5x+7)} + \frac{6\sqrt{11}\sqrt{2x-5}E\left(\sin^{-1}\left(\frac{2\sqrt{2-3x}}{\sqrt{11}}\right) \middle| -\frac{1}{2}\right)}{25\sqrt{5-2x}}$$

```
[Out] -(Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/(5*(7 + 5*x)) + (6*Sqrt[11]*Sqrt[-5 + 2*x]*EllipticE[ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2])/(25*Sqrt[5 - 2*x]) + (152*Sqrt[2/33]*Sqrt[5 - 2*x]*EllipticF[ArcSin[Sqrt[3/11]*Sqrt[1 + 4*x]], 1/3])/(125*Sqrt[-5 + 2*x]) + (26859*Sqrt[5 - 2*x]*EllipticPi[55/124, ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2])/(7750*Sqrt[11]*Sqrt[-5 + 2*x])
```

Rubi [A] time = 0.21081, antiderivative size = 189, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 10, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}} = 0.286$, Rules used = {160, 1607, 168, 538, 537, 158, 114, 113, 121, 119}

$$-\frac{\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}}{5(5x+7)} + \frac{152\sqrt{\frac{2}{33}}\sqrt{5-2x}F\left(\sin^{-1}\left(\sqrt{\frac{3}{11}}\sqrt{4x+1}\right) \middle| \frac{1}{3}\right)}{125\sqrt{2x-5}} + \frac{6\sqrt{11}\sqrt{2x-5}E\left(\sin^{-1}\left(\frac{2\sqrt{2-3x}}{\sqrt{11}}\right) \middle| -\frac{1}{2}\right)}{25\sqrt{5-2x}} + \frac{26859\sqrt{5-2x}\text{EllipticPi}\left[\frac{55}{124}, \sin^{-1}\left(\frac{2\sqrt{2-3x}}{\sqrt{11}}\right) \middle| -\frac{1}{2}\right]}{7750\sqrt{11}\sqrt{2x-5}}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/(7 + 5*x)^2,x]
```

```
[Out] -(Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/(5*(7 + 5*x)) + (6*Sqrt[11]*Sqrt[-5 + 2*x]*EllipticE[ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2])/(25*Sqrt[5 - 2*x]) + (152*Sqrt[2/33]*Sqrt[5 - 2*x]*EllipticF[ArcSin[Sqrt[3/11]*Sqrt[1 + 4*x]], 1/3])/(125*Sqrt[-5 + 2*x]) + (26859*Sqrt[5 - 2*x]*EllipticPi[55/124, ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2])/(7750*Sqrt[11]*Sqrt[-5 + 2*x])
```

Rule 160

```
Int[((a_.) + (b_.)*(x_))^(m_)*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)], x_Symbol] :> Simp[((a + b*x)^(m + 1)*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(b*(m + 1)), x] - Dist[1/(2*b*(m + 1)), Int[((a + b*x)^(m + 1)*Simp[d*e*g + c*f*g + c*e*h + 2*(d*f*g + d*e*h + c*f*h)*x + 3*d*f*h*x^2, x])/(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]), x], x
```

] /; FreeQ[{a, b, c, d, e, f, g, h, m}, x] && IntegerQ[2*m] && LtQ[m, -1]

Rule 1607

Int[(Px_)*((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p_.)*((g_.) + (h_.)*(x_))^(q_.), x_Symbol] := Dist[PolynomialRemainder[Px, a + b*x, x], Int[(a + b*x)^m*(c + d*x)^n*(e + f*x)^p*(g + h*x)^q, x], x] + Int[PolynomialQuotient[Px, a + b*x, x]*(a + b*x)^(m + 1)*(c + d*x)^n*(e + f*x)^p*(g + h*x)^q, x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n, p, q}, x] && PolyQ[Px, x] && EqQ[m, -1]

Rule 168

Int[1/(((a_.) + (b_.)*(x_))*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Dist[-2, Subst[Int[1/(Simp[b*c - a*d - b*x^2, x]*Sqrt[Simp[(d*e - c*f)/d + (f*x^2)/d, x]]*Sqrt[Simp[(d*g - c*h)/d + (h*x^2)/d, x]]), x], x, Sqrt[c + d*x]], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x] && GtQ[(d*e - c*f)/d, 0]

Rule 538

Int[1/(((a_) + (b_.)*(x_)^2)*Sqrt[(c_) + (d_.)*(x_)^2]*Sqrt[(e_) + (f_.)*(x_)^2]), x_Symbol] := Dist[Sqrt[1 + (d*x^2)/c]/Sqrt[c + d*x^2], Int[1/((a + b*x^2)*Sqrt[1 + (d*x^2)/c]*Sqrt[e + f*x^2]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && !GtQ[c, 0]

Rule 537

Int[1/(((a_) + (b_.)*(x_)^2)*Sqrt[(c_) + (d_.)*(x_)^2]*Sqrt[(e_) + (f_.)*(x_)^2]), x_Symbol] := Simp[(1*EllipticPi[(b*c)/(a*d), ArcSin[Rt[-(d/c), 2]*x], (c*f)/(d*e)])/(a*Sqrt[c]*Sqrt[e]*Rt[-(d/c), 2]), x] /; FreeQ[{a, b, c, d, e, f}, x] && !GtQ[d/c, 0] && GtQ[c, 0] && GtQ[e, 0] && !(!GtQ[f/e, 0] && SimplerSqrtQ[-(f/e), -(d/c)])

Rule 158

Int[((g_.) + (h_.)*(x_))/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x_)]), x_Symbol] := Dist[h/f, Int[Sqrt[e + f*x]/(Sqrt[a + b*x]*Sqrt[c + d*x]), x], x] + Dist[(f*g - e*h)/f, Int[1/(Sqrt[a + b*x]*Sqrt[c + d*x]*Sqrt[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x] && SimplerQ[a + b*x, e + f*x] && SimplerQ[c + d*x, e + f*x]

Rule 114

```

Int[Sqrt[(e_.) + (f_.)*(x_)]/(Sqrt[(a_) + (b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_
)]), x_Symbol] :=> Dist[(Sqrt[e + f*x]*Sqrt[(b*(c + d*x))/(b*c - a*d)])/(Sqr
t[c + d*x]*Sqrt[(b*(e + f*x))/(b*e - a*f)]), Int[Sqrt[(b*e)/(b*e - a*f) + (
b*f*x)/(b*e - a*f)]/(Sqrt[a + b*x]*Sqrt[(b*c)/(b*c - a*d) + (b*d*x)/(b*c -
a*d))], x], x] /; FreeQ[{a, b, c, d, e, f}, x] && !(GtQ[b/(b*c - a*d), 0]
&& GtQ[b/(b*e - a*f), 0]) && !LtQ[-((b*c - a*d)/d), 0]

```

Rule 113

```

Int[Sqrt[(e_.) + (f_.)*(x_)]/(Sqrt[(a_) + (b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_
)]), x_Symbol] :=> Simp[(2*Rt[-((b*e - a*f)/d), 2]*EllipticE[ArcSin[Sqrt[a +
b*x]/Rt[-((b*c - a*d)/d), 2]], (f*(b*c - a*d))/(d*(b*e - a*f))]/b, x] /;
FreeQ[{a, b, c, d, e, f}, x] && GtQ[b/(b*c - a*d), 0] && GtQ[b/(b*e - a*f),
0] && !LtQ[-((b*c - a*d)/d), 0] && !(SimplerQ[c + d*x, a + b*x] && GtQ[-
(d/(b*c - a*d)), 0] && GtQ[d/(d*e - c*f), 0] && !LtQ[(b*c - a*d)/b, 0])

```

Rule 121

```

Int[1/(Sqrt[(a_) + (b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x
_)]), x_Symbol] :=> Dist[Sqrt[(b*(c + d*x))/(b*c - a*d)]/Sqrt[c + d*x], Int[
1/(Sqrt[a + b*x]*Sqrt[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)]*Sqrt[e + f*x
]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && !GtQ[(b*c - a*d)/b, 0] && Si
mplerQ[a + b*x, c + d*x] && SimplerQ[a + b*x, e + f*x]

```

Rule 119

```

Int[1/(Sqrt[(a_) + (b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x
_)]), x_Symbol] :=> Simp[(2*Rt[-(b/d), 2]*EllipticF[ArcSin[Sqrt[a + b*x]/(Rt
[-(b/d), 2]*Sqrt[(b*c - a*d)/b])], (f*(b*c - a*d))/(d*(b*e - a*f)))]/(b*Sqr
t[(b*e - a*f)/b]), x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[(b*c - a*d)/b,
0] && GtQ[(b*e - a*f)/b, 0] && PosQ[-(b/d)] && !(SimplerQ[c + d*x, a + b*
x] && GtQ[(d*e - c*f)/d, 0] && GtQ[-(d/b), 0]) && !(SimplerQ[c + d*x, a +
b*x] && GtQ[-(b*e) + a*f, 0] && GtQ[-(f/b), 0]) && !(SimplerQ[e + f*x,
a + b*x] && GtQ[-(d*e) + c*f, 0] && GtQ[-(b*e) + a*f, 0] && (PosQ[
-(f/d)] || PosQ[-(f/b)]))

```

Rubi steps

$$\begin{aligned}
\int \frac{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{(7+5x)^2} dx &= -\frac{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{5(7+5x)} + \frac{1}{10} \int \frac{-21+140x-72x^2}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)} dx \\
&= -\frac{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{5(7+5x)} + \frac{1}{10} \int \frac{\frac{1204}{25} - \frac{72x}{5}}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}} dx - \frac{8953}{250} \int \frac{1}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}} dx \\
&= -\frac{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{5(7+5x)} - \frac{18}{25} \int \frac{\sqrt{-5+2x}}{\sqrt{2-3x}\sqrt{1+4x}} dx + \frac{152}{125} \int \frac{1}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}} dx \\
&= -\frac{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{5(7+5x)} + \frac{\left(152\sqrt{\frac{2}{11}}\sqrt{5-2x}\right) \int \frac{1}{\sqrt{2-3x}\sqrt{\frac{10-4x}{11}}\sqrt{1+4x}} dx}{125\sqrt{-5+2x}} + \frac{8953}{250} \int \frac{1}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}} dx \\
&= -\frac{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{5(7+5x)} + \frac{6\sqrt{11}\sqrt{-5+2x}E\left(\sin^{-1}\left(\frac{2\sqrt{2-3x}}{\sqrt{11}}\right)\middle|\frac{1}{2}\right)}{25\sqrt{5-2x}} + \frac{152\sqrt{\frac{2}{33}}\sqrt{5-2x}}{125}
\end{aligned}$$

Mathematica [A] time = 0.751783, size = 132, normalized size = 0.7

$$\frac{\sqrt{2x-5} \left(\frac{3\sqrt{11} \left(9424 \operatorname{EllipticF} \left(\sin^{-1} \left(\frac{2\sqrt{2-3x}}{\sqrt{11}} \right), -\frac{1}{2} \right) + 20460 E \left(\sin^{-1} \left(\frac{2\sqrt{2-3x}}{\sqrt{11}} \right) \middle| -\frac{1}{2} \right) + 26859 \Pi \left(\frac{55}{124}; -\sin^{-1} \left(\frac{2\sqrt{2-3x}}{\sqrt{11}} \right) \middle| -\frac{1}{2} \right) \right)}{\sqrt{5-2x}} - \frac{51150\sqrt{2-3x}\sqrt{4x+1}}{5x+7} \right)}{255750}$$

Antiderivative was successfully verified.

[In] Integrate[(Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/(7 + 5*x)^2,x]

[Out] (Sqrt[-5 + 2*x]*((-51150*Sqrt[2 - 3*x]*Sqrt[1 + 4*x])/(7 + 5*x) + (3*Sqrt[1 + 4*x]*(20460*EllipticE[ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2] + 9424*EllipticF[ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2] + 26859*EllipticPi[55/124, -ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2]))/Sqrt[5 - 2*x]))/255750

Maple [B] time = 0.025, size = 320, normalized size = 1.7

$$\frac{1}{(2046000x^3 - 5967500x^2 + 1790250x + 852500)(7 + 5x)} \sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1} \left(47120\sqrt{11}\sqrt{2-3x}\sqrt{5-2x}\sqrt{4x+1} \right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((2-3*x)^(1/2)*(2*x-5)^(1/2)*(4*x+1)^(1/2)/(7+5*x)^2,x)
```

```
[Out] 1/85250*(2-3*x)^(1/2)*(2*x-5)^(1/2)*(4*x+1)^(1/2)*(47120*11^(1/2)*(2-3*x)^(1/2)*(5-2*x)^(1/2)*(4*x+1)^(1/2)*EllipticF(2/11*(22-33*x)^(1/2),1/2*I*2^(1/2))*x+102300*11^(1/2)*(2-3*x)^(1/2)*(5-2*x)^(1/2)*(4*x+1)^(1/2)*EllipticE(2/11*(22-33*x)^(1/2),1/2*I*2^(1/2))*x-134295*11^(1/2)*(2-3*x)^(1/2)*(5-2*x)^(1/2)*(4*x+1)^(1/2)*EllipticPi(2/11*(22-33*x)^(1/2),55/124,1/2*I*2^(1/2))*x+65968*11^(1/2)*(2-3*x)^(1/2)*(5-2*x)^(1/2)*(4*x+1)^(1/2)*EllipticF(2/11*(22-33*x)^(1/2),1/2*I*2^(1/2))+143220*11^(1/2)*(2-3*x)^(1/2)*(5-2*x)^(1/2)*(4*x+1)^(1/2)*EllipticE(2/11*(22-33*x)^(1/2),1/2*I*2^(1/2))-188013*11^(1/2)*(2-3*x)^(1/2)*(5-2*x)^(1/2)*(4*x+1)^(1/2)*EllipticPi(2/11*(22-33*x)^(1/2),55/124,1/2*I*2^(1/2))-409200*x^3+1193500*x^2-358050*x-170500)/(24*x^3-70*x^2+21*x+10)/(7+5*x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2}}{(5x+7)^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((2-3*x)^(1/2)*(-5+2*x)^(1/2)*(1+4*x)^(1/2)/(7+5*x)^2,x, algorithm="maxima")
```

```
[Out] integrate(sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)/(5*x + 7)^2, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2}}{25x^2+70x+49}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((2-3*x)^(1/2)*(-5+2*x)^(1/2)*(1+4*x)^(1/2)/(7+5*x)^2,x, algorithm="fricas")
```

```
[Out] integral(sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)/(25*x^2 + 70*x + 49), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}}{(5x+7)^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2-3*x)**(1/2)*(-5+2*x)**(1/2)*(1+4*x)**(1/2)/(7+5*x)**2,x)

[Out] Integral(sqrt(2 - 3*x)*sqrt(2*x - 5)*sqrt(4*x + 1)/(5*x + 7)**2, x)

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2}}{(5x+7)^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2-3*x)^(1/2)*(-5+2*x)^(1/2)*(1+4*x)^(1/2)/(7+5*x)^2,x, algorithm="giac")

[Out] integrate(sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)/(5*x + 7)^2, x)

$$3.41 \quad \int \frac{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{(7+5x)^3} dx$$

Optimal. Leaf size=227

$$\frac{397\sqrt{\frac{3}{22}}\sqrt{5-2x}\text{EllipticF}\left(\sin^{-1}\left(\sqrt{\frac{3}{11}}\sqrt{4x+1}\right), \frac{1}{3}\right)}{89125\sqrt{2x-5}} + \frac{8953\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}}{556140(5x+7)} - \frac{\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}}{10(5x+7)^2} - \frac{8953\sqrt{11}\sqrt{2x-5}}{10(5x+7)^2}$$

```
[Out] -(Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/(10*(7 + 5*x)^2) + (8953*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/(556140*(7 + 5*x)) - (8953*Sqrt[11]*Sqrt[-5 + 2*x]*EllipticE[ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2])/(1390350*Sqrt[5 - 2*x]) + (397*Sqrt[3/22]*Sqrt[5 - 2*x]*EllipticF[ArcSin[Sqrt[3/11]*Sqrt[1 + 4*x]], 1/3])/(89125*Sqrt[-5 + 2*x]) - (14832503*Sqrt[5 - 2*x]*EllipticPi[55/124, ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2])/(287339000*Sqrt[11]*Sqrt[-5 + 2*x])
```

Rubi [A] time = 0.308533, antiderivative size = 227, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 11, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}} = 0.314$, Rules used = {160, 1604, 1607, 168, 538, 537, 158, 114, 113, 121, 119}

$$\frac{8953\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}}{556140(5x+7)} - \frac{\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}}{10(5x+7)^2} + \frac{397\sqrt{\frac{3}{22}}\sqrt{5-2x}F\left(\sin^{-1}\left(\sqrt{\frac{3}{11}}\sqrt{4x+1}\right)\middle|\frac{1}{3}\right)}{89125\sqrt{2x-5}} - \frac{8953\sqrt{11}\sqrt{2x-5}}{10(5x+7)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/(7 + 5*x)^3,x]
```

```
[Out] -(Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/(10*(7 + 5*x)^2) + (8953*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/(556140*(7 + 5*x)) - (8953*Sqrt[11]*Sqrt[-5 + 2*x]*EllipticE[ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2])/(1390350*Sqrt[5 - 2*x]) + (397*Sqrt[3/22]*Sqrt[5 - 2*x]*EllipticF[ArcSin[Sqrt[3/11]*Sqrt[1 + 4*x]], 1/3])/(89125*Sqrt[-5 + 2*x]) - (14832503*Sqrt[5 - 2*x]*EllipticPi[55/124, ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2])/(287339000*Sqrt[11]*Sqrt[-5 + 2*x])
```

Rule 160

```
Int[((a_.) + (b_.)*(x_))^(m_)*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)], x_Symbol] := Simp[((a + b*x)^(m + 1)*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(b*(m + 1)), x] - Dist[1/(2*b*(m + 1)),
```


Int[((a + b*x)^(m + 1)*Simp[d*e*g + c*f*g + c*e*h + 2*(d*f*g + d*e*h + c*f*h)*x + 3*d*f*h*x^2, x])/(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]), x] /; FreeQ[{a, b, c, d, e, f, g, h, m}, x] && IntegerQ[2*m] && LtQ[m, -1]

Rule 1604

Int[(((a_.) + (b_.)*(x_))^(m_)*((A_.) + (B_.)*(x_) + (C_.)*(x_)^2))/(Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] :> Simp[((A*b^2 - a*b*B + a^2*C)*(a + b*x)^(m + 1)*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(m + 1)*(b*c - a*d)*(b*e - a*f)*(b*g - a*h)), x] - Dist[1/(2*(m + 1)*(b*c - a*d)*(b*e - a*f)*(b*g - a*h)), Int[((a + b*x)^(m + 1)/(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]))*Simp[A*(2*a^2*d*f*h*(m + 1) - 2*a*b*(m + 1)*(d*f*g + d*e*h + c*f*h) + b^2*(2*m + 3)*(d*e*g + c*f*g + c*e*h)) - (b*B - a*C)*(a*(d*e*g + c*f*g + c*e*h) + 2*b*c*e*g*(m + 1)) - 2*((A*b - a*B)*(a*d*f*h*(m + 1) - b*(m + 2)*(d*f*g + d*e*h + c*f*h)) - C*(a^2*(d*f*g + d*e*h + c*f*h) - b^2*c*e*g*(m + 1) + a*b*(m + 1)*(d*e*g + c*f*g + c*e*h)))*x + d*f*h*(2*m + 5)*(A*b^2 - a*b*B + a^2*C)*x^2, x], x] /; FreeQ[{a, b, c, d, e, f, g, h, A, B, C}, x] && IntegerQ[2*m] && LtQ[m, -1]

Rule 1607

Int[(Px_)*((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_)*((e_.) + (f_.)*(x_))^(p_)*((g_.) + (h_.)*(x_))^(q_), x_Symbol] :> Dist[PolynomialRemainder[Px, a + b*x, x], Int[(a + b*x)^m*(c + d*x)^n*(e + f*x)^p*(g + h*x)^q, x], x] + Int[PolynomialQuotient[Px, a + b*x, x]*(a + b*x)^(m + 1)*(c + d*x)^n*(e + f*x)^p*(g + h*x)^q, x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n, p, q}, x] && PolyQ[Px, x] && EqQ[m, -1]

Rule 168

Int[1/(((a_.) + (b_.)*(x_))*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] :> Dist[-2, Subst[Int[1/(Simp[b*c - a*d - b*x^2, x]*Sqrt[Simp[(d*e - c*f)/d + (f*x^2)/d, x]]*Sqrt[Simp[(d*g - c*h)/d + (h*x^2)/d, x]]), x], x, Sqrt[c + d*x]], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x] && GtQ[(d*e - c*f)/d, 0]

Rule 538

Int[1/(((a_) + (b_.)*(x_)^2)*Sqrt[(c_) + (d_.)*(x_)^2]*Sqrt[(e_) + (f_.)*(x_)^2]), x_Symbol] :> Dist[Sqrt[1 + (d*x^2)/c]/Sqrt[c + d*x^2], Int[1/((a + b*x^2)*Sqrt[1 + (d*x^2)/c]*Sqrt[e + f*x^2]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && !GtQ[c, 0]

Rule 537

```
Int[1/(((a_) + (b_)*(x_)^2)*Sqrt[(c_) + (d_)*(x_)^2]*Sqrt[(e_) + (f_)*(x_)^2]), x_Symbol] := Simp[(1*EllipticPi[(b*c)/(a*d), ArcSin[Rt[-(d/c), 2]*x], (c*f)/(d*e)]]/(a*Sqrt[c]*Sqrt[e]*Rt[-(d/c), 2]), x] /; FreeQ[{a, b, c, d, e, f}, x] && !GtQ[d/c, 0] && GtQ[c, 0] && GtQ[e, 0] && !( !GtQ[f/e, 0] && SimplersqrtQ[-(f/e), -(d/c)])]
```

Rule 158

```
Int[((g_) + (h_)*(x_))/(Sqrt[(a_) + (b_)*(x_)]*Sqrt[(c_) + (d_)*(x_)]*Sqrt[(e_) + (f_)*(x_)]), x_Symbol] := Dist[h/f, Int[Sqrt[e + f*x]/(Sqrt[a + b*x]*Sqrt[c + d*x]), x], x] + Dist[(f*g - e*h)/f, Int[1/(Sqrt[a + b*x]*Sqrt[c + d*x]*Sqrt[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x] && SimplersqrtQ[a + b*x, e + f*x] && SimplersqrtQ[c + d*x, e + f*x]
```

Rule 114

```
Int[Sqrt[(e_) + (f_)*(x_)]/(Sqrt[(a_) + (b_)*(x_)]*Sqrt[(c_) + (d_)*(x_)]), x_Symbol] := Dist[(Sqrt[e + f*x]*Sqrt[(b*(c + d*x))/(b*c - a*d)]]/(Sqrt[c + d*x]*Sqrt[(b*(e + f*x))/(b*e - a*f)]), Int[Sqrt[(b*e)/(b*e - a*f) + (b*f*x)/(b*e - a*f)]/(Sqrt[a + b*x]*Sqrt[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && !(GtQ[b/(b*c - a*d), 0] && GtQ[b/(b*e - a*f), 0]) && !LtQ[-((b*c - a*d)/d), 0]
```

Rule 113

```
Int[Sqrt[(e_) + (f_)*(x_)]/(Sqrt[(a_) + (b_)*(x_)]*Sqrt[(c_) + (d_)*(x_)]), x_Symbol] := Simp[(2*Rt[-((b*e - a*f)/d), 2]*EllipticE[ArcSin[Sqrt[a + b*x]/Rt[-((b*c - a*d)/d), 2]], (f*(b*c - a*d))/(d*(b*e - a*f))]/b, x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[b/(b*c - a*d), 0] && GtQ[b/(b*e - a*f), 0] && !LtQ[-((b*c - a*d)/d), 0] && !(SimplersqrtQ[c + d*x, a + b*x] && GtQ[-(d/(b*c - a*d)), 0] && GtQ[d/(d*e - c*f), 0] && !LtQ[(b*c - a*d)/b, 0])
```

Rule 121

```
Int[1/(Sqrt[(a_) + (b_)*(x_)]*Sqrt[(c_) + (d_)*(x_)]*Sqrt[(e_) + (f_)*(x_)]), x_Symbol] := Dist[Sqrt[(b*(c + d*x))/(b*c - a*d)]/Sqrt[c + d*x], Int[1/(Sqrt[a + b*x]*Sqrt[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)]*Sqrt[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && !GtQ[(b*c - a*d)/b, 0] && SimplersqrtQ[a + b*x, c + d*x] && SimplersqrtQ[a + b*x, e + f*x]
```

Rule 119

```
Int[1/(Sqrt[(a_) + (b_)*(x_)]*Sqrt[(c_) + (d_)*(x_)]*Sqrt[(e_) + (f_)*(x_)]), x_Symbol] := Simp[(2*Rt[-(b/d), 2]*EllipticF[ArcSin[Sqrt[a + b*x]/Rt[-(b/d), 2]*Sqrt[(b*c - a*d)/b]]], (f*(b*c - a*d))/(d*(b*e - a*f))]/(b*Sqr
```

```
t[(b*e - a*f)/b], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[(b*c - a*d)/b, 0] && GtQ[(b*e - a*f)/b, 0] && PosQ[-(b/d)] && !(SimplerQ[c + d*x, a + b*x] && GtQ[(d*e - c*f)/d, 0] && GtQ[-(d/b), 0]) && !(SimplerQ[c + d*x, a + b*x] && GtQ[(-(b*e) + a*f)/f, 0] && GtQ[-(f/b), 0]) && !(SimplerQ[e + f*x, a + b*x] && GtQ[(-(d*e) + c*f)/f, 0] && GtQ[(-(b*e) + a*f)/f, 0] && (PosQ[-(f/d)] || PosQ[-(f/b)]))
```

Rubi steps

$$\begin{aligned}
\int \frac{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{(7+5x)^3} dx &= -\frac{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{10(7+5x)^2} + \frac{1}{20} \int \frac{-21+140x-72x^2}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^2} dx \\
&= -\frac{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{10(7+5x)^2} + \frac{8953\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{556140(7+5x)} + \frac{\int \frac{-106729-199200x+}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}}{1112280} \\
&= -\frac{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{10(7+5x)^2} + \frac{8953\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{556140(7+5x)} + \frac{\int \frac{-2500104}{25} + \frac{214872}{5}}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}}{1112280} \\
&= -\frac{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{10(7+5x)^2} + \frac{8953\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{556140(7+5x)} + \frac{1191 \int \frac{1}{\sqrt{2-3x}\sqrt{-5+2x}}}{178250} \\
&= -\frac{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{10(7+5x)^2} + \frac{8953\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{556140(7+5x)} + \frac{(1191\sqrt{5-2x}) \int}{89125\sqrt{}} \\
&= -\frac{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{10(7+5x)^2} + \frac{8953\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{556140(7+5x)} - \frac{8953\sqrt{11}\sqrt{-5+2x}}{1390}
\end{aligned}$$

Mathematica [A] time = 0.696315, size = 136, normalized size = 0.6

$$\sqrt{2x-5} \left(\frac{\sqrt{11} \left(5759676 \operatorname{EllipticF} \left(\sin^{-1} \left(\frac{2\sqrt{2-3x}}{\sqrt{11}} \right), -\frac{1}{2} \right) - 61059460 E \left(\sin^{-1} \left(\frac{2\sqrt{2-3x}}{\sqrt{11}} \right) \middle| -\frac{1}{2} \right) - 44497509 \Pi \left(\frac{55}{124}; -\sin^{-1} \left(\frac{2\sqrt{2-3x}}{\sqrt{11}} \right) \middle| -\frac{1}{2} \right) \right)}{\sqrt{5-2x}} + \frac{17050\sqrt{2-3x}\sqrt{4x+1}}{(5x+7)^2} \right)$$

9482187000

Antiderivative was successfully verified.

[In] Integrate[(Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/(7 + 5*x)^3,x]

```
[Out] (Sqrt[-5 + 2*x]*((17050*Sqrt[2 - 3*x]*Sqrt[1 + 4*x]*(7057 + 44765*x))/(7 + 5*x)^2 + (Sqrt[11]*(-61059460*EllipticE[ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2] + 5759676*EllipticF[ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2] - 44497509*EllipticPi[55/124, -ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2]))/Sqrt[5 - 2*x]))/9482187000
```

Maple [B] time = 0.025, size = 461, normalized size = 2.

$$\frac{1}{(227572488000x^3 - 663753090000x^2 + 199125927000x + 94821870000)(7 + 5x)^2 \sqrt{2 - 3x} \sqrt{2x - 5} \sqrt{4x + 1}} \left(143991 \right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((2-3*x)^(1/2)*(2*x-5)^(1/2)*(4*x+1)^(1/2)/(7+5*x)^3,x)
```

```
[Out] 1/9482187000*(2-3*x)^(1/2)*(2*x-5)^(1/2)*(4*x+1)^(1/2)*(143991900*11^(1/2)*(2-3*x)^(1/2)*(5-2*x)^(1/2)*(4*x+1)^(1/2)*EllipticF(2/11*(22-33*x)^(1/2),1/2*I*2^(1/2))*x^2-1526486500*11^(1/2)*(2-3*x)^(1/2)*(5-2*x)^(1/2)*(4*x+1)^(1/2)*EllipticE(2/11*(22-33*x)^(1/2),1/2*I*2^(1/2))*x^2+1112437725*11^(1/2)*(2-3*x)^(1/2)*(5-2*x)^(1/2)*(4*x+1)^(1/2)*EllipticPi(2/11*(22-33*x)^(1/2),55/124,1/2*I*2^(1/2))*x^2+403177320*11^(1/2)*(2-3*x)^(1/2)*(5-2*x)^(1/2)*(4*x+1)^(1/2)*EllipticF(2/11*(22-33*x)^(1/2),1/2*I*2^(1/2))*x-4274162200*11^(1/2)*(2-3*x)^(1/2)*(5-2*x)^(1/2)*(4*x+1)^(1/2)*EllipticE(2/11*(22-33*x)^(1/2),1/2*I*2^(1/2))*x+3114825630*11^(1/2)*(2-3*x)^(1/2)*(5-2*x)^(1/2)*(4*x+1)^(1/2)*EllipticPi(2/11*(22-33*x)^(1/2),55/124,1/2*I*2^(1/2))*x+282224124*11^(1/2)*(2-3*x)^(1/2)*(5-2*x)^(1/2)*(4*x+1)^(1/2)*EllipticF(2/11*(22-33*x)^(1/2),1/2*I*2^(1/2))-2991913540*11^(1/2)*(2-3*x)^(1/2)*(5-2*x)^(1/2)*(4*x+1)^(1/2)*EllipticE(2/11*(22-33*x)^(1/2),1/2*I*2^(1/2))+2180377941*11^(1/2)*(2-3*x)^(1/2)*(5-2*x)^(1/2)*(4*x+1)^(1/2)*EllipticPi(2/11*(22-33*x)^(1/2),55/124,1/2*I*2^(1/2))+18317838000*x^4-50539303100*x^3+7605578750*x^2+10159191350*x+1203218500)/(24*x^3-70*x^2+21*x+10)/(7+5*x)^2
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2}}{(5x+7)^3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2-3*x)^(1/2)*(-5+2*x)^(1/2)*(1+4*x)^(1/2)/(7+5*x)^3,x, algorithm="maxima")

[Out] integrate(sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)/(5*x + 7)^3, x)

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2}}{125x^3+525x^2+735x+343}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2-3*x)^(1/2)*(-5+2*x)^(1/2)*(1+4*x)^(1/2)/(7+5*x)^3,x, algorithm="fricas")

[Out] integral(sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)/(125*x^3 + 525*x^2 + 735*x + 343), x)

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}}{(5x+7)^3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2-3*x)**(1/2)*(-5+2*x)**(1/2)*(1+4*x)**(1/2)/(7+5*x)**3,x)

[Out] Integral(sqrt(2 - 3*x)*sqrt(2*x - 5)*sqrt(4*x + 1)/(5*x + 7)**3, x)

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2}}{(5x+7)^3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((2-3*x)^(1/2)*(-5+2*x)^(1/2)*(1+4*x)^(1/2)/(7+5*x)^3,x, algorithm="giac")
```

```
[Out] integrate(sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)/(5*x + 7)^3, x)
```

$$3.42 \quad \int \frac{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{(7+5x)^4} dx$$

Optimal. Leaf size=263

$$\frac{24957247\sqrt{5-2x}\text{EllipticF}\left(\sin^{-1}\left(\sqrt{\frac{3}{11}}\sqrt{4x+1}\right), \frac{1}{3}\right)}{4956597750\sqrt{66}\sqrt{2x-5}} + \frac{16830401\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}}{30929169960(5x+7)} + \frac{8953\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}}{1668420(5x+7)^2}$$

```
[Out] -(Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/((15*(7 + 5*x))^3) + (8953*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/((1668420*(7 + 5*x))^2) + (16830401*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/((30929169960*(7 + 5*x)) - (16830401*Sqrt[11]*Sqrt[-5 + 2*x]*EllipticE[ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2])/(77322924900*Sqrt[5 - 2*x])) + (24957247*Sqrt[5 - 2*x]*EllipticF[ArcSin[Sqrt[3/11]*Sqrt[1 + 4*x]], 1/3])/(4956597750*Sqrt[66]*Sqrt[-5 + 2*x]) + (15664616449*Sqrt[5 - 2*x]*EllipticPi[55/124, ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2])/(15980071146000*Sqrt[11]*Sqrt[-5 + 2*x])
```

Rubi [A] time = 0.397013, antiderivative size = 263, normalized size of antiderivative = 1., number of steps used = 12, number of rules used = 11, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}} = 0.314$, Rules used = {160, 1604, 1607, 168, 538, 537, 158, 114, 113, 121, 119}

$$\frac{16830401\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}}{30929169960(5x+7)} + \frac{8953\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}}{1668420(5x+7)^2} - \frac{\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}}{15(5x+7)^3} + \frac{24957247\sqrt{5-2x}\text{EllipticF}\left(\sin^{-1}\left(\sqrt{\frac{3}{11}}\sqrt{4x+1}\right), \frac{1}{3}\right)}{4956597750\sqrt{66}\sqrt{2x-5}}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/(7 + 5*x)^4, x]
```

```
[Out] -(Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/((15*(7 + 5*x))^3) + (8953*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/((1668420*(7 + 5*x))^2) + (16830401*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/((30929169960*(7 + 5*x)) - (16830401*Sqrt[11]*Sqrt[-5 + 2*x]*EllipticE[ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2])/(77322924900*Sqrt[5 - 2*x])) + (24957247*Sqrt[5 - 2*x]*EllipticF[ArcSin[Sqrt[3/11]*Sqrt[1 + 4*x]], 1/3])/(4956597750*Sqrt[66]*Sqrt[-5 + 2*x]) + (15664616449*Sqrt[5 - 2*x]*EllipticPi[55/124, ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2])/(15980071146000*Sqrt[11]*Sqrt[-5 + 2*x])
```

Rule 160

```
Int[((a_.) + (b_.)*(x_))^(m_)*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)], x_Symbol] := Simp[((a + b*x)^(m + 1)*Sqrt[c
```

```

+ d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(b*(m + 1)), x] - Dist[1/(2*b*(m + 1)),
  Int[((a + b*x)^(m + 1)*Simp[d*e*g + c*f*g + c*e*h + 2*(d*f*g + d*e*h + c*f
*h)*x + 3*d*f*h*x^2, x])/(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]), x], x
] /; FreeQ[{a, b, c, d, e, f, g, h, m}, x] && IntegerQ[2*m] && LtQ[m, -1]

```

Rule 1604

```

Int[(((a_.) + (b_.)*(x_))^(m_.)*((A_.) + (B_.)*(x_) + (C_.)*(x_)^2))/(Sqrt[(
c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Sy
mbol] := Simp[((A*b^2 - a*b*B + a^2*C)*(a + b*x)^(m + 1)*Sqrt[c + d*x]*Sqrt
[e + f*x]*Sqrt[g + h*x])/((m + 1)*(b*c - a*d)*(b*e - a*f)*(b*g - a*h)), x]
- Dist[1/(2*(m + 1)*(b*c - a*d)*(b*e - a*f)*(b*g - a*h)), Int[((a + b*x)^(m
+ 1)/(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]))*Simp[A*(2*a^2*d*f*h*(m +
1) - 2*a*b*(m + 1)*(d*f*g + d*e*h + c*f*h) + b^2*(2*m + 3)*(d*e*g + c*f*g
+ c*e*h)) - (b*B - a*C)*(a*(d*e*g + c*f*g + c*e*h) + 2*b*c*e*g*(m + 1)) - 2
*((A*b - a*B)*(a*d*f*h*(m + 1) - b*(m + 2)*(d*f*g + d*e*h + c*f*h)) - C*(a^
2*(d*f*g + d*e*h + c*f*h) - b^2*c*e*g*(m + 1) + a*b*(m + 1)*(d*e*g + c*f*g
+ c*e*h))] * x + d*f*h*(2*m + 5)*(A*b^2 - a*b*B + a^2*C)*x^2, x], x] /; F
reeQ[{a, b, c, d, e, f, g, h, A, B, C}, x] && IntegerQ[2*m] && LtQ[m, -1]

```

Rule 1607

```

Int[(Px_)*((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f
_.)*(x_))^(p_.)*((g_.) + (h_.)*(x_))^(q_.), x_Symbol] := Dist[PolynomialRem
ainder[Px, a + b*x, x], Int[(a + b*x)^m*(c + d*x)^n*(e + f*x)^p*(g + h*x)^q
, x], x] + Int[PolynomialQuotient[Px, a + b*x, x]*(a + b*x)^(m + 1)*(c + d*
x)^n*(e + f*x)^p*(g + h*x)^q, x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n, p,
q}, x] && PolyQ[Px, x] && EqQ[m, -1]

```

Rule 168

```

Int[1/(((a_.) + (b_.)*(x_))*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_
)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Dist[-2, Subst[Int[1/(Simp[b*c -
a*d - b*x^2, x]*Sqrt[Simp[(d*e - c*f)/d + (f*x^2)/d, x]]*Sqrt[Simp[(d*g -
c*h)/d + (h*x^2)/d, x]]), x], x, Sqrt[c + d*x]], x] /; FreeQ[{a, b, c, d, e
, f, g, h}, x] && GtQ[(d*e - c*f)/d, 0]

```

Rule 538

```

Int[1/(((a_) + (b_.)*(x_)^2)*Sqrt[(c_) + (d_.)*(x_)^2]*Sqrt[(e_) + (f_.)*(x
_)^2]), x_Symbol] := Dist[Sqrt[1 + (d*x^2)/c]/Sqrt[c + d*x^2], Int[1/((a +
b*x^2)*Sqrt[1 + (d*x^2)/c]*Sqrt[e + f*x^2]), x], x] /; FreeQ[{a, b, c, d, e
, f}, x] && !GtQ[c, 0]

```


Rule 537

```
Int[1/(((a_) + (b_)*(x_)^2)*Sqrt[(c_) + (d_)*(x_)^2]*Sqrt[(e_) + (f_)*(x_)^2]), x_Symbol] := Simp[(1*EllipticPi[(b*c)/(a*d), ArcSin[Rt[-(d/c), 2]*x], (c*f)/(d*e)])/(a*Sqrt[c]*Sqrt[e]*Rt[-(d/c), 2]), x] /; FreeQ[{a, b, c, d, e, f}, x] && !GtQ[d/c, 0] && GtQ[c, 0] && GtQ[e, 0] && !( !GtQ[f/e, 0] && SimplersqrtQ[-(f/e), -(d/c)])
```

Rule 158

```
Int[((g_) + (h_)*(x_))/(Sqrt[(a_) + (b_)*(x_)]*Sqrt[(c_) + (d_)*(x_)]*Sqrt[(e_) + (f_)*(x_)]), x_Symbol] := Dist[h/f, Int[Sqrt[e + f*x]/(Sqrt[a + b*x]*Sqrt[c + d*x]), x], x] + Dist[(f*g - e*h)/f, Int[1/(Sqrt[a + b*x]*Sqrt[c + d*x]*Sqrt[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x] && SimplersqrtQ[a + b*x, e + f*x] && SimplersqrtQ[c + d*x, e + f*x]
```

Rule 114

```
Int[Sqrt[(e_) + (f_)*(x_)]/(Sqrt[(a_) + (b_)*(x_)]*Sqrt[(c_) + (d_)*(x_)]), x_Symbol] := Dist[(Sqrt[e + f*x]*Sqrt[(b*(c + d*x))/(b*c - a*d)])/(Sqrt[c + d*x]*Sqrt[(b*(e + f*x))/(b*e - a*f)]), Int[Sqrt[(b*e)/(b*e - a*f) + (b*f*x)/(b*e - a*f)]/(Sqrt[a + b*x]*Sqrt[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && !(GtQ[b/(b*c - a*d), 0] && GtQ[b/(b*e - a*f), 0]) && !LtQ[-((b*c - a*d)/d), 0]
```

Rule 113

```
Int[Sqrt[(e_) + (f_)*(x_)]/(Sqrt[(a_) + (b_)*(x_)]*Sqrt[(c_) + (d_)*(x_)]), x_Symbol] := Simp[(2*Rt[-((b*e - a*f)/d), 2]*EllipticE[ArcSin[Sqrt[a + b*x]/Rt[-((b*c - a*d)/d), 2]], (f*(b*c - a*d))/(d*(b*e - a*f)))/b, x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[b/(b*c - a*d), 0] && GtQ[b/(b*e - a*f), 0] && !LtQ[-((b*c - a*d)/d), 0] && !(SimplersqrtQ[c + d*x, a + b*x] && GtQ[-(d/(b*c - a*d)), 0] && GtQ[d/(d*e - c*f), 0] && !LtQ[(b*c - a*d)/b, 0])
```

Rule 121

```
Int[1/(Sqrt[(a_) + (b_)*(x_)]*Sqrt[(c_) + (d_)*(x_)]*Sqrt[(e_) + (f_)*(x_)]), x_Symbol] := Dist[Sqrt[(b*(c + d*x))/(b*c - a*d)]/Sqrt[c + d*x], Int[1/(Sqrt[a + b*x]*Sqrt[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)]*Sqrt[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && !GtQ[(b*c - a*d)/b, 0] && SimplersqrtQ[a + b*x, c + d*x] && SimplersqrtQ[a + b*x, e + f*x]
```

Rule 119

```
Int[1/(Sqrt[(a_) + (b_)*(x_)]*Sqrt[(c_) + (d_)*(x_)]*Sqrt[(e_) + (f_)*(x_)]), x_Symbol] := Dist[Sqrt[(b*(c + d*x))/(b*c - a*d)]/Sqrt[c + d*x], Int[1/(Sqrt[a + b*x]*Sqrt[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)]*Sqrt[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && !GtQ[(b*c - a*d)/b, 0] && SimplersqrtQ[a + b*x, c + d*x] && SimplersqrtQ[a + b*x, e + f*x]
```

```

_)]), x_Symbol] := Simp[(2*Rt[-(b/d), 2]*EllipticF[ArcSin[Sqrt[a + b*x]/(Rt
[-(b/d), 2]*Sqrt[(b*c - a*d)/b]])], (f*(b*c - a*d))/(d*(b*e - a*f)))]/(b*Sqr
t[(b*e - a*f)/b]), x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[(b*c - a*d)/b,
0] && GtQ[(b*e - a*f)/b, 0] && PosQ[-(b/d)] && !(SimplerQ[c + d*x, a + b*
x] && GtQ[(d*e - c*f)/d, 0] && GtQ[-(d/b), 0]) && !(SimplerQ[c + d*x, a +
b*x] && GtQ[-(b*e) + a*f)/f, 0] && GtQ[-(f/b), 0]) && !(SimplerQ[e + f*x,
a + b*x] && GtQ[-(d*e) + c*f)/f, 0] && GtQ[-(b*e) + a*f)/f, 0] && (PosQ[
-(f/d)] || PosQ[-(f/b)])

```

Rubi steps

$$\begin{aligned}
\int \frac{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{(7+5x)^4} dx &= -\frac{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{15(7+5x)^3} + \frac{1}{30} \int \frac{-21+140x-72x^2}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^3} dx \\
&= -\frac{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{15(7+5x)^3} + \frac{8953\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{1668420(7+5x)^2} + \frac{\int \frac{-401471+855020x-2}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}} dx}{3336840} \\
&= -\frac{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{15(7+5x)^3} + \frac{8953\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{1668420(7+5x)^2} + \frac{16830401\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{3092916990} \\
&= -\frac{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{15(7+5x)^3} + \frac{8953\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{1668420(7+5x)^2} + \frac{16830401\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{3092916990} \\
&= -\frac{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{15(7+5x)^3} + \frac{8953\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{1668420(7+5x)^2} + \frac{16830401\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{3092916990} \\
&= -\frac{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{15(7+5x)^3} + \frac{8953\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{1668420(7+5x)^2} + \frac{16830401\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{3092916990} \\
&= -\frac{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{15(7+5x)^3} + \frac{8953\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{1668420(7+5x)^2} + \frac{16830401\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{3092916990}
\end{aligned}$$

Mathematica [A] time = 0.753849, size = 141, normalized size = 0.54

$$\sqrt{2x-5} \left(\frac{\sqrt{11} \left(120693246492 \operatorname{EllipticF} \left(\sin^{-1} \left(\frac{2\sqrt{2-3x}}{\sqrt{11}} \right), -\frac{1}{2} \right) - 114783334820 E \left(\sin^{-1} \left(\frac{2\sqrt{2-3x}}{\sqrt{11}} \right), -\frac{1}{2} \right) + 46993849347 \Pi \left(\frac{55}{124}; -\sin^{-1} \left(\frac{2\sqrt{2-3x}}{\sqrt{11}} \right), -\frac{1}{2} \right) \right)}{\sqrt{5-2x}} + \frac{17050\sqrt{2x-5}}{\sqrt{5-2x}} \right)$$

527342347818000

Antiderivative was successfully verified.

[In] Integrate[(Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/(7 + 5*x)^4,x]

[Out] (Sqrt[-5 + 2*x]*((17050*Sqrt[2 - 3*x]*Sqrt[1 + 4*x]*(-75460017 + 2007981640*x + 420760025*x^2))/(7 + 5*x)^3 + (Sqrt[11]*(-114783334820*EllipticE[ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2] + 120693246492*EllipticF[ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2] + 46993849347*EllipticPi[55/124, -ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2]])/Sqrt[5 - 2*x]))/527342347818000

Maple [B] time = 0.026, size = 602, normalized size = 2.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] int((2-3*x)^(1/2)*(2*x-5)^(1/2)*(4*x+1)^(1/2)/(7+5*x)^4,x)

[Out] 1/527342347818000*(2-3*x)^(1/2)*(2*x-5)^(1/2)*(4*x+1)^(1/2)*(15086655811500*11^(1/2)*(2-3*x)^(1/2)*(5-2*x)^(1/2)*(4*x+1)^(1/2)*EllipticF(2/11*(22-33*x)^(1/2),1/2*I*2^(1/2))*x^3-14347916852500*11^(1/2)*(2-3*x)^(1/2)*(5-2*x)^(1/2)*(4*x+1)^(1/2)*EllipticE(2/11*(22-33*x)^(1/2),1/2*I*2^(1/2))*x^3-5874231168375*11^(1/2)*(2-3*x)^(1/2)*(5-2*x)^(1/2)*(4*x+1)^(1/2)*EllipticPi(2/11*(22-33*x)^(1/2),55/124,1/2*I*2^(1/2))*x^3+63363954408300*11^(1/2)*(2-3*x)^(1/2)*(5-2*x)^(1/2)*(4*x+1)^(1/2)*EllipticF(2/11*(22-33*x)^(1/2),1/2*I*2^(1/2))*x^2-60261250780500*11^(1/2)*(2-3*x)^(1/2)*(5-2*x)^(1/2)*(4*x+1)^(1/2)*EllipticE(2/11*(22-33*x)^(1/2),1/2*I*2^(1/2))*x^2-24671770907175*11^(1/2)*(2-3*x)^(1/2)*(5-2*x)^(1/2)*(4*x+1)^(1/2)*EllipticPi(2/11*(22-33*x)^(1/2),55/124,1/2*I*2^(1/2))*x^2+88709536171620*11^(1/2)*(2-3*x)^(1/2)*(5-2*x)^(1/2)*(4*x+1)^(1/2)*EllipticF(2/11*(22-33*x)^(1/2),1/2*I*2^(1/2))*x-84365751092700*11^(1/2)*(2-3*x)^(1/2)*(5-2*x)^(1/2)*(4*x+1)^(1/2)*EllipticE(2/11*(22-33*x)^(1/2),1/2*I*2^(1/2))*x-34540479270045*11^(1/2)*(2-3*x)^(1/2)*(5-2*x)^(1/2)*(4*x+1)^(1/2)*EllipticPi(2/11*(22-33*x)^(1/2),55/124,1/2*I*2^(1/2))*x+41397783546756*11^(1/2)*(2-3*x)^(1/2)*(5-2*x)^(1/2)*(4*x+1)^(1/2)*EllipticF(2/11*(22-33*x)^(1/2),1/2*I*2^(1/2))-39370683843260*11^(1/2)*(2-3*x)^(1/2)*(5-2*x)^(1/2)*(4*x+1)^(1/2)*EllipticE(2/11*(22-33*x)^(1/2),1/2*I*2^(1/2))-16118890326021*11^(1/2)*(2-3*x)^(1/2)*(5-2*x)^(1/2)*(4*x+1)^(1/2)*EllipticPi(2/11*(22-33*x)^(1/2),55/124,1/2*I*2^(1/2))+172175002230000*x^5+319488997250500*x^4-2276751199345150*x^3+880758940754000*x^2+315342410533150*x-12865932898500)/(24*x^3-70*x^2+21*x+10)/(7+5*x)^3

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2}}{(5x+7)^4} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2-3*x)^(1/2)*(-5+2*x)^(1/2)*(1+4*x)^(1/2)/(7+5*x)^4,x, algorithm="maxima")

[Out] integrate(sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)/(5*x + 7)^4, x)

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2}}{625x^4 + 3500x^3 + 7350x^2 + 6860x + 2401}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2-3*x)^(1/2)*(-5+2*x)^(1/2)*(1+4*x)^(1/2)/(7+5*x)^4,x, algorithm="fricas")

[Out] integral(sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)/(625*x^4 + 3500*x^3 + 7350*x^2 + 6860*x + 2401), x)

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}}{(5x+7)^4} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2-3*x)**(1/2)*(-5+2*x)**(1/2)*(1+4*x)**(1/2)/(7+5*x)**4,x)

[Out] Integral(sqrt(2 - 3*x)*sqrt(2*x - 5)*sqrt(4*x + 1)/(5*x + 7)**4, x)

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2}}{(5x+7)^4} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((2-3*x)^(1/2)*(-5+2*x)^(1/2)*(1+4*x)^(1/2)/(7+5*x)^4,x, algorithm="giac")
```

```
[Out] integrate(sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)/(5*x + 7)^4, x)
```

$$3.43 \quad \int \frac{\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}}{a+bx} dx$$

Optimal. Leaf size=570

$$\frac{2\sqrt{cf-de}\sqrt{\frac{d(e+fx)}{de-cf}}\sqrt{\frac{d(g+hx)}{dg-ch}}\left(3a^2dfh^2-3abh^2(cf+de)+b^2(-(dg(fg-eh)-ch(2eh+fg)))\right)\text{EllipticF}\left(\sin^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{cf-de}}\right)\right)}{3b^3d\sqrt{fh}\sqrt{e+fx}\sqrt{g+hx}}$$

[Out] (2*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(3*b) - (2*Sqrt[-(d*e) + c*f] * (3*a*d*f*h - b*(d*f*g + d*e*h + c*f*h))*Sqrt[(d*(e + f*x))/(d*e - c*f)]*Sqrt[g + h*x]*EllipticE[ArcSin[(Sqrt[f]*Sqrt[c + d*x])/Sqrt[-(d*e) + c*f]], ((d*e - c*f)*h)/(f*(d*g - c*h)))]/(3*b^2*d*Sqrt[f]*h*Sqrt[e + f*x]*Sqrt[(d*(g + h*x))/(d*g - c*h)]) + (2*Sqrt[-(d*e) + c*f]*(3*a^2*d*f*h^2 - 3*a*b*(d*e + c*f)*h^2 - b^2*(d*g*(f*g - e*h) - c*h*(f*g + 2*e*h)))*Sqrt[(d*(e + f*x))/(d*e - c*f)]*Sqrt[(d*(g + h*x))/(d*g - c*h)]*EllipticF[ArcSin[(Sqrt[f]*Sqrt[c + d*x])/Sqrt[-(d*e) + c*f]], ((d*e - c*f)*h)/(f*(d*g - c*h)))]/(3*b^3*d*Sqrt[f]*h*Sqrt[e + f*x]*Sqrt[g + h*x]) - (2*(b*e - a*f)*Sqrt[-(d*e) + c*f]*(b*g - a*h)*Sqrt[(d*(e + f*x))/(d*e - c*f)]*Sqrt[(d*(g + h*x))/(d*g - c*h)]*EllipticPi[-((b*(d*e - c*f))/(b*c - a*d)*f), ArcSin[(Sqrt[f]*Sqrt[c + d*x])/Sqrt[-(d*e) + c*f]], ((d*e - c*f)*h)/(f*(d*g - c*h)))]/(b^3*Sqrt[f]*Sqrt[e + f*x]*Sqrt[g + h*x])

Rubi [A] time = 1.28584, antiderivative size = 570, normalized size of antiderivative = 1., number of steps used = 12, number of rules used = 10, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}} = 0.286$, Rules used = {161, 1607, 169, 538, 537, 158, 114, 113, 121, 120}

$$\frac{2\sqrt{cf-de}\sqrt{\frac{d(e+fx)}{de-cf}}\sqrt{\frac{d(g+hx)}{dg-ch}}\left(3a^2dfh^2-3abh^2(cf+de)+b^2(-(dg(fg-eh)-ch(2eh+fg)))\right)F\left(\sin^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{cf-de}}\right)\right)\frac{(de-cf)}{f(dg-ch)}}{3b^3d\sqrt{fh}\sqrt{e+fx}\sqrt{g+hx}}$$

Antiderivative was successfully verified.

[In] Int[(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(a + b*x), x]

[Out] (2*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(3*b) - (2*Sqrt[-(d*e) + c*f] * (3*a*d*f*h - b*(d*f*g + d*e*h + c*f*h))*Sqrt[(d*(e + f*x))/(d*e - c*f)]*Sqrt[g + h*x]*EllipticE[ArcSin[(Sqrt[f]*Sqrt[c + d*x])/Sqrt[-(d*e) + c*f]], ((d*e - c*f)*h)/(f*(d*g - c*h)))]/(3*b^2*d*Sqrt[f]*h*Sqrt[e + f*x]*Sqrt[(d*(g + h*x))/(d*g - c*h)]) + (2*Sqrt[-(d*e) + c*f]*(3*a^2*d*f*h^2 - 3*a*b*(d*e

```

+ c*f)*h^2 - b^2*(d*g*(f*g - e*h) - c*h*(f*g + 2*e*h))*Sqrt[(d*(e + f*x))
/(d*e - c*f)]*Sqrt[(d*(g + h*x))/(d*g - c*h)]*EllipticF[ArcSin[(Sqrt[f]*Sqr
t[c + d*x])/Sqrt[-(d*e) + c*f]], ((d*e - c*f)*h)/(f*(d*g - c*h)))]/(3*b^3*d
*Sqrt[f]*h*Sqrt[e + f*x]*Sqrt[g + h*x]) - (2*(b*e - a*f)*Sqrt[-(d*e) + c*f]
*(b*g - a*h)*Sqrt[(d*(e + f*x))/(d*e - c*f)]*Sqrt[(d*(g + h*x))/(d*g - c*h)
]*EllipticPi[-((b*(d*e - c*f))/((b*c - a*d)*f)), ArcSin[(Sqrt[f]*Sqrt[c + d
*x])/Sqrt[-(d*e) + c*f]], ((d*e - c*f)*h)/(f*(d*g - c*h)))]/(b^3*Sqrt[f]*Sq
rt[e + f*x]*Sqrt[g + h*x])

```

Rule 161

```

Int[((a_.) + (b_.)*(x_))^(m_)*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(
x_)]*Sqrt[(g_.) + (h_.)*(x_)], x_Symbol] := Simp[(2*(a + b*x)^(m + 1)*Sqrt[
c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(b*(2*m + 5)), x] + Dist[1/(b*(2*m +
5)), Int[((a + b*x)^m*Simp[3*b*c*e*g - a*(d*e*g + c*f*g + c*e*h) + 2*(b*(d*
e*g + c*f*g + c*e*h) - a*(d*f*g + d*e*h + c*f*h))*x - (3*a*d*f*h - b*(d*f*g
+ d*e*h + c*f*h))*x^2, x])/(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]), x]
, x] /; FreeQ[{a, b, c, d, e, f, g, h, m}, x] && IntegerQ[2*m] && !LtQ[m,
-1]

```

Rule 1607

```

Int[(Px_)*((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f
_.)*(x_))^(p_.)*((g_.) + (h_.)*(x_))^(q_.), x_Symbol] := Dist[PolynomialRem
ainder[Px, a + b*x, x], Int[(a + b*x)^m*(c + d*x)^n*(e + f*x)^p*(g + h*x)^q
, x], x] + Int[PolynomialQuotient[Px, a + b*x, x]*(a + b*x)^(m + 1)*(c + d*
x)^n*(e + f*x)^p*(g + h*x)^q, x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n, p,
q}, x] && PolyQ[Px, x] && EqQ[m, -1]

```

Rule 169

```

Int[1/(((a_.) + (b_.)*(x_))*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_
)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Dist[-2, Subst[Int[1/(Simp[b*c -
a*d - b*x^2, x]*Sqrt[Simp[(d*e - c*f)/d + (f*x^2)/d, x]]*Sqrt[Simp[(d*g -
c*h)/d + (h*x^2)/d, x]]], x], x, Sqrt[c + d*x]], x] /; FreeQ[{a, b, c, d, e
, f, g, h}, x] && !SimplerQ[e + f*x, c + d*x] && !SimplerQ[g + h*x, c + d
*x]

```

Rule 538

```

Int[1/(((a_) + (b_.)*(x_)^2)*Sqrt[(c_) + (d_.)*(x_)^2]*Sqrt[(e_) + (f_.)*(x
_)^2]), x_Symbol] := Dist[Sqrt[1 + (d*x^2)/c]/Sqrt[c + d*x^2], Int[1/((a +
b*x^2)*Sqrt[1 + (d*x^2)/c]*Sqrt[e + f*x^2]), x], x] /; FreeQ[{a, b, c, d, e
, f}, x] && !GtQ[c, 0]

```

Rule 537

```
Int[1/(((a_) + (b_)*(x_)^2)*Sqrt[(c_) + (d_)*(x_)^2]*Sqrt[(e_) + (f_)*(x_)^2]), x_Symbol] :> Simp[(1*EllipticPi[(b*c)/(a*d), ArcSin[Rt[-(d/c), 2]*x], (c*f)/(d*e))]/(a*Sqrt[c]*Sqrt[e]*Rt[-(d/c), 2]), x] /; FreeQ[{a, b, c, d, e, f}, x] && !GtQ[d/c, 0] && GtQ[c, 0] && GtQ[e, 0] && !( !GtQ[f/e, 0] && SimplrSqrtQ[-(f/e), -(d/c)])
```

Rule 158

```
Int[((g_) + (h_)*(x_))/(Sqrt[(a_) + (b_)*(x_)]*Sqrt[(c_) + (d_)*(x_)]*Sqrt[(e_) + (f_)*(x_)]), x_Symbol] :> Dist[h/f, Int[Sqrt[e + f*x]/(Sqrt[a + b*x]*Sqrt[c + d*x]), x], x] + Dist[(f*g - e*h)/f, Int[1/(Sqrt[a + b*x]*Sqrt[c + d*x]*Sqrt[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x] && SimplrQ[a + b*x, e + f*x] && SimplrQ[c + d*x, e + f*x]
```

Rule 114

```
Int[Sqrt[(e_) + (f_)*(x_)]/(Sqrt[(a_) + (b_)*(x_)]*Sqrt[(c_) + (d_)*(x_)]), x_Symbol] :> Dist[(Sqrt[e + f*x]*Sqrt[(b*(c + d*x))/(b*c - a*d)])/(Sqrt[c + d*x]*Sqrt[(b*(e + f*x))/(b*e - a*f)]), Int[Sqrt[(b*e)/(b*e - a*f) + (b*f*x)/(b*e - a*f)]/(Sqrt[a + b*x]*Sqrt[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && !(GtQ[b/(b*c - a*d), 0] && GtQ[b/(b*e - a*f), 0]) && !LtQ[-((b*c - a*d)/d), 0]
```

Rule 113

```
Int[Sqrt[(e_) + (f_)*(x_)]/(Sqrt[(a_) + (b_)*(x_)]*Sqrt[(c_) + (d_)*(x_)]), x_Symbol] :> Simp[(2*Rt[-((b*e - a*f)/d), 2]*EllipticE[ArcSin[Sqrt[a + b*x]/Rt[-((b*c - a*d)/d), 2]], (f*(b*c - a*d))/(d*(b*e - a*f))]/b, x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[b/(b*c - a*d), 0] && GtQ[b/(b*e - a*f), 0] && !LtQ[-((b*c - a*d)/d), 0] && !(SimplerQ[c + d*x, a + b*x] && GtQ[-(d/(b*c - a*d)), 0] && GtQ[d/(d*e - c*f), 0] && !LtQ[(b*c - a*d)/b, 0])
```

Rule 121

```
Int[1/(Sqrt[(a_) + (b_)*(x_)]*Sqrt[(c_) + (d_)*(x_)]*Sqrt[(e_) + (f_)*(x_)]), x_Symbol] :> Dist[Sqrt[(b*(c + d*x))/(b*c - a*d)]/Sqrt[c + d*x], Int[1/(Sqrt[a + b*x]*Sqrt[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)]*Sqrt[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && !GtQ[(b*c - a*d)/b, 0] && SimplrQ[a + b*x, c + d*x] && SimplrQ[a + b*x, e + f*x]
```

Rule 120

```
Int[1/(Sqrt[(a_) + (b_)*(x_)]*Sqrt[(c_) + (d_)*(x_)]*Sqrt[(e_) + (f_)*(x_)]), x_Symbol] :> Dist[Sqrt[(b*(c + d*x))/(b*c - a*d)]/Sqrt[c + d*x], Int[1/(Sqrt[a + b*x]*Sqrt[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)]*Sqrt[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && !GtQ[(b*c - a*d)/b, 0] && SimplrQ[a + b*x, c + d*x] && SimplrQ[a + b*x, e + f*x]
```



```

_)]], x_Symbol] := Simp[(2*Rt[-(b/d), 2]*EllipticF[ArcSin[Sqrt[a + b*x]/(Rt
[-(b/d), 2]*Sqrt[(b*c - a*d)/b]])], (f*(b*c - a*d))/(d*(b*e - a*f)))]/(b*Sqr
t[(b*e - a*f)/b]), x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[b/(b*c - a*d),
0] && GtQ[b/(b*e - a*f), 0] && SimplerQ[a + b*x, c + d*x] && SimplerQ[a +
b*x, e + f*x] && (PosQ[-((b*c - a*d)/d)] || NegQ[-((b*e - a*f)/f)])

```

Rubi steps

$$\begin{aligned}
\int \frac{\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}}{a+bx} dx &= \frac{2\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}}{3b} + \frac{\int \frac{3bceg-a(deg+cfg+ceh)+2(b(deg+cfg+ceh)-a(dfh+deh+cfh))x-(3adf}{(a+bx)\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}}}{3b} \\
&= \frac{2\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}}{3b} + \frac{\int \frac{2deg+2cfg-\frac{3adfg}{b}+2ceh-\frac{3adeh}{b}-\frac{3acf}{b}+\frac{3a^2dfh}{b^2}+(dfh+deh+cfh-\frac{3adf}{b}}{\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}}}{3b} \\
&= \frac{2\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}}{3b} - \frac{(2(bc-ad)(be-af)(bg-ah)) \text{Subst} \left(\int \frac{1}{(bc-ad-bx^2)\sqrt{e-\frac{cf}{d}}} \right)}{b^3} \\
&= \frac{2\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}}{3b} - \frac{\left(2(bc-ad)(be-af)(bg-ah)\sqrt{\frac{d(e+fx)}{de-cf}}\right) \text{Subst} \left(\int \frac{1}{(bc-ad)} \right)}{b^3\sqrt{e+fx}} \\
&= \frac{2\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}}{3b} - \frac{2\sqrt{-de+cf}(3adfh-b(dfh+deh+cfh))\sqrt{\frac{d(e+fx)}{de-cf}}\sqrt{g}}{3b^2d\sqrt{fh}\sqrt{e+fx}\sqrt{\frac{d(g+h)}{dg-c}}} \\
&= \frac{2\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}}{3b} - \frac{2\sqrt{-de+cf}(3adfh-b(dfh+deh+cfh))\sqrt{\frac{d(e+fx)}{de-cf}}\sqrt{g}}{3b^2d\sqrt{fh}\sqrt{e+fx}\sqrt{\frac{d(g+h)}{dg-c}}}
\end{aligned}$$

Mathematica [C] time = 13.8408, size = 1250, normalized size = 2.19

$$2\sqrt{c+dx} \left(\frac{b^2 f h c^3}{d^2(c+dx)} - \frac{b^2 f h c^2}{d^2} - \frac{3abf h c^2}{d(c+dx)} + \frac{3abf h c}{d} + \frac{b^2 f h x c}{d} - \frac{b^2 e g c}{c+dx} + \frac{3abf g c}{c+dx} + \frac{3abehc}{c+dx} - \frac{b^2 e^2 h c}{c f + d x f} - \frac{b^2 f g^2 c}{c h + d x h} + b^2 f h x^2 + 3b^2 e g - 3abf \right)$$

Antiderivative was successfully verified.

[In] Integrate[(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(a + b*x),x]

[Out] (2*Sqrt[c + d*x]*(3*b^2*e*g - 3*a*b*f*g + (b^2*f*g^2)/h - 3*a*b*e*h + (b^2*e^2*h)/f - (b^2*c^2*f*h)/d^2 + (3*a*b*c*f*h)/d + 2*b^2*f*g*x + 2*b^2*e*h*x - 3*a*b*f*h*x + (b^2*c*f*h*x)/d + b^2*f*h*x^2 - (b^2*c*e*g)/(c + d*x) - (3*a*b*d*e*g)/(c + d*x) + (3*a*b*c*f*g)/(c + d*x) + (3*a*b*c*e*h)/(c + d*x) + (b^2*c^3*f*h)/(d^2*(c + d*x)) - (3*a*b*c^2*f*h)/(d*(c + d*x)) + (b^2*d*e^2*g)/(c*f + d*f*x) - (b^2*c*e^2*h)/(c*f + d*f*x) + (b^2*d*e*g^2)/(c*h + d*h*x) - (b^2*c*f*g^2)/(c*h + d*h*x) - (I*b*Sqrt[-c + (d*g)/h]*(3*a*d*f*h - b*(d*f*g + d*e*h + c*f*h))*Sqrt[c + d*x]*Sqrt[(d*(e + f*x))/(f*(c + d*x))]*Sqrt[(d*(g + h*x))/(h*(c + d*x))]*EllipticE[I*ArcSinh[Sqrt[-c + (d*g)/h]/Sqrt[c + d*x]], (d*e*h - c*f*h)/(d*f*g - c*f*h)]/d^2 + (I*b*Sqrt[-c + (d*g)/h]*(-b*f*g) - 2*b*e*h + 3*a*f*h)*Sqrt[c + d*x]*Sqrt[(d*(e + f*x))/(f*(c + d*x))]*Sqrt[(d*(g + h*x))/(h*(c + d*x))]*EllipticF[I*ArcSinh[Sqrt[-c + (d*g)/h]/Sqrt[c + d*x]], (d*e*h - c*f*h)/(d*f*g - c*f*h)]/d + ((3*I)*b^2*e*g*Sqrt[-c + (d*g)/h]*h*Sqrt[c + d*x]*Sqrt[(d*(e + f*x))/(f*(c + d*x))]*Sqrt[(d*(g + h*x))/(h*(c + d*x))]*EllipticPi[((b*c - a*d)*h)/(b*(-(d*g) + c*h)), I*ArcSinh[Sqrt[-c + (d*g)/h]/Sqrt[c + d*x]], (d*e*h - c*f*h)/(d*f*g - c*f*h)]/(d*g - c*h) + ((3*I)*a^2*f*Sqrt[-c + (d*g)/h]*h^2*Sqrt[c + d*x]*Sqrt[(d*(e + f*x))/(f*(c + d*x))]*Sqrt[(d*(g + h*x))/(h*(c + d*x))]*EllipticPi[((b*c - a*d)*h)/(b*(-(d*g) + c*h)), I*ArcSinh[Sqrt[-c + (d*g)/h]/Sqrt[c + d*x]], (d*e*h - c*f*h)/(d*f*g - c*f*h)]/(d*g - c*h) + ((3*I)*a*b*f*g*Sqrt[-c + (d*g)/h]*h*Sqrt[c + d*x]*Sqrt[(d*(e + f*x))/(f*(c + d*x))]*Sqrt[(d*(g + h*x))/(h*(c + d*x))]*EllipticPi[((b*c - a*d)*h)/(b*(-(d*g) + c*h)), I*ArcSinh[Sqrt[-c + (d*g)/h]/Sqrt[c + d*x]], (d*e*h - c*f*h)/(d*f*g - c*f*h)]/(-d*g) + c*h) + ((3*I)*a*b*e*Sqrt[-c + (d*g)/h]*h^2*Sqrt[c + d*x]*Sqrt[(d*(e + f*x))/(f*(c + d*x))]*Sqrt[(d*(g + h*x))/(h*(c + d*x))]*EllipticPi[((b*c - a*d)*h)/(b*(-(d*g) + c*h)), I*ArcSinh[Sqrt[-c + (d*g)/h]/Sqrt[c + d*x]], (d*e*h - c*f*h)/(d*f*g - c*f*h)]/(-d*g) + c*h)))/(3*b^3*Sqrt[e + f*x]*Sqrt[g + h*x])

Maple [B] time = 0.059, size = 3678, normalized size = 6.5

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] $\text{int}((d*x+c)^{(1/2)}*(f*x+e)^{(1/2)}*(h*x+g)^{(1/2)}/(b*x+a), x)$

[Out] $2/3*(((d*x+c)*f/(c*f-d*e))^{(1/2)}*(-(h*x+g)*d/(c*h-d*g))^{(1/2)}*(-(f*x+e)*d/(c*f-d*e))^{(1/2)}*EllipticE(((d*x+c)*f/(c*f-d*e))^{(1/2)}, ((c*f-d*e)*h/f/(c*h-d*g))^{(1/2)})*b^2*c*d^2*e*f*g*h+3*((d*x+c)*f/(c*f-d*e))^{(1/2)}*(-(h*x+g)*d/(c*h-d*g))^{(1/2)}*(-(f*x+e)*d/(c*f-d*e))^{(1/2)}*EllipticPi(((d*x+c)*f/(c*f-d*e))^{(1/2)}, -(c*f-d*e)*b/f/(a*d-b*c), ((c*f-d*e)*h/f/(c*h-d*g))^{(1/2)})*a*b*c*d^2*e*f*h^2+3*((d*x+c)*f/(c*f-d*e))^{(1/2)}*(-(h*x+g)*d/(c*h-d*g))^{(1/2)}*(-(f*x+e)*d/(c*f-d*e))^{(1/2)}*EllipticPi(((d*x+c)*f/(c*f-d*e))^{(1/2)}, -(c*f-d*e)*b/f/(a*d-b*c), ((c*f-d*e)*h/f/(c*h-d*g))^{(1/2)})*a*b*c*d^2*f^2*g*h+3*((d*x+c)*f/(c*f-d*e))^{(1/2)}*(-(h*x+g)*d/(c*h-d*g))^{(1/2)}*(-(f*x+e)*d/(c*f-d*e))^{(1/2)}*EllipticPi(((d*x+c)*f/(c*f-d*e))^{(1/2)}, -(c*f-d*e)*b/f/(a*d-b*c), ((c*f-d*e)*h/f/(c*h-d*g))^{(1/2)})*a^2*d^3*e*f*h^2-3*((d*x+c)*f/(c*f-d*e))^{(1/2)}*(-(h*x+g)*d/(c*h-d*g))^{(1/2)}*(-(f*x+e)*d/(c*f-d*e))^{(1/2)}*EllipticF(((d*x+c)*f/(c*f-d*e))^{(1/2)}, ((c*f-d*e)*h/f/(c*h-d*g))^{(1/2)})*a^2*d^3*e*f*h^2+3*((d*x+c)*f/(c*f-d*e))^{(1/2)}*(-(h*x+g)*d/(c*h-d*g))^{(1/2)}*(-(f*x+e)*d/(c*f-d*e))^{(1/2)}*EllipticF(((d*x+c)*f/(c*f-d*e))^{(1/2)}, ((c*f-d*e)*h/f/(c*h-d*g))^{(1/2)})*a*b*d^3*e^2*h^2-2*((d*x+c)*f/(c*f-d*e))^{(1/2)}*(-(h*x+g)*d/(c*h-d*g))^{(1/2)}*(-(f*x+e)*d/(c*f-d*e))^{(1/2)}*EllipticF(((d*x+c)*f/(c*f-d*e))^{(1/2)}, ((c*f-d*e)*h/f/(c*h-d*g))^{(1/2)})*b^2*c*d^2*e^2*h^2-3*((d*x+c)*f/(c*f-d*e))^{(1/2)}*(-(h*x+g)*d/(c*h-d*g))^{(1/2)}*(-(f*x+e)*d/(c*f-d*e))^{(1/2)}*EllipticPi(((d*x+c)*f/(c*f-d*e))^{(1/2)}, -(c*f-d*e)*b/f/(a*d-b*c), ((c*f-d*e)*h/f/(c*h-d*g))^{(1/2)})*a^2*c*d^2*f^2*h^2-3*((d*x+c)*f/(c*f-d*e))^{(1/2)}*(-(h*x+g)*d/(c*h-d*g))^{(1/2)}*(-(f*x+e)*d/(c*f-d*e))^{(1/2)}*EllipticF(((d*x+c)*f/(c*f-d*e))^{(1/2)}, ((c*f-d*e)*h/f/(c*h-d*g))^{(1/2)})*a*b*c^2*d*f^2*h^2+2*((d*x+c)*f/(c*f-d*e))^{(1/2)}*(-(h*x+g)*d/(c*h-d*g))^{(1/2)}*(-(f*x+e)*d/(c*f-d*e))^{(1/2)}*EllipticF(((d*x+c)*f/(c*f-d*e))^{(1/2)}, ((c*f-d*e)*h/f/(c*h-d*g))^{(1/2)})*b^2*c^2*d*e*f*h^2+((d*x+c)*f/(c*f-d*e))^{(1/2)}*(-(h*x+g)*d/(c*h-d*g))^{(1/2)}*(-(f*x+e)*d/(c*f-d*e))^{(1/2)}*EllipticF(((d*x+c)*f/(c*f-d*e))^{(1/2)}, ((c*f-d*e)*h/f/(c*h-d*g))^{(1/2)})*b^2*c^2*d*f^2*g*h+3*((d*x+c)*f/(c*f-d*e))^{(1/2)}*(-(h*x+g)*d/(c*h-d*g))^{(1/2)}*(-(f*x+e)*d/(c*f-d*e))^{(1/2)}*EllipticE(((d*x+c)*f/(c*f-d*e))^{(1/2)}, ((c*f-d*e)*h/f/(c*h-d*g))^{(1/2)})*a*b*c^2*d*f^2*h^2+x^2*b^2*c*d^2*f^2*h^2+x^2*b^2*d^3*e*f*h^2+3*((d*x+c)*f/(c*f-d*e))^{(1/2)}*(-(h*x+g)*d/(c*h-d*g))^{(1/2)}*(-(f*x+e)*d/(c*f-d*e))^{(1/2)}*EllipticF(((d*x+c)*f/(c*f-d*e))^{(1/2)}, ((c*f-d*e)*h/f/(c*h-d*g))^{(1/2)})*a^2*c*d^2*f^2*h^2-3*((d*x+c)*f/(c*f-d*e))^{(1/2)}*(-(h*x+g)*d/(c*h-d*g))^{(1/2)}*(-(f*x+e)*d/(c*f-d*e))^{(1/2)}*EllipticPi(((d*x+c)*f/(c*f-d*e))^{(1/2)}, -(c*f-d*e)*b/f/(a*d-b*c), ((c*f-d*e)*h/f/(c*h-d*g))^{(1/2)})*a*b*d^3*e^2*h^2+3*((d*x+c)*f/(c*f-d*e))^{(1/2)}*(-(h*x+g)*d/(c*h-d*g))^{(1/2)}$

$$\begin{aligned}
&) * (- (f * x + e) * d / (c * f - d * e)) ^ {1/2} * \text{EllipticPi}(((d * x + c) * f / (c * f - d * e)) ^ {1/2}, - (c * f \\
& - d * e) * b / f / (a * d - b * c), ((c * f - d * e) * h / f / (c * h - d * g)) ^ {1/2})) * b ^ 2 * d ^ 3 * e ^ 2 * g * h + ((d * x + \\
& c) * f / (c * f - d * e)) ^ {1/2} * (- (h * x + g) * d / (c * h - d * g)) ^ {1/2} * (- (f * x + e) * d / (c * f - d * e)) ^ {1/2} \\
& * \text{EllipticE}(((d * x + c) * f / (c * f - d * e)) ^ {1/2}, ((c * f - d * e) * h / f / (c * h - d * g)) ^ {1/2})) \\
& * b ^ 2 * c * d ^ 2 * e ^ 2 * h ^ 2 + ((d * x + c) * f / (c * f - d * e)) ^ {1/2} * (- (h * x + g) * d / (c * h - d * g)) ^ {1/2} \\
& * (- (f * x + e) * d / (c * f - d * e)) ^ {1/2} * \text{EllipticE}(((d * x + c) * f / (c * f - d * e)) ^ {1/2}, ((c * f - d * e) * h / f / (c * h - d * g)) ^ {1/2})) \\
& * b ^ 2 * c * d ^ 2 * f ^ 2 * g ^ 2 - ((d * x + c) * f / (c * f - d * e)) ^ {1/2} * (- (h * x + g) * d / (c * h - d * g)) ^ {1/2} * (- (f * x + e) * d / (c * f - d * e)) ^ {1/2} \\
& * \text{EllipticE}(((d * x + c) * f / (c * f - d * e)) ^ {1/2}, ((c * f - d * e) * h / f / (c * h - d * g)) ^ {1/2})) * b ^ 2 * d ^ 3 * e ^ 2 * g * h + b ^ 2 * c * d ^ \\
& 2 * e * f * g * h - ((d * x + c) * f / (c * f - d * e)) ^ {1/2} * (- (h * x + g) * d / (c * h - d * g)) ^ {1/2} * (- (f * x + e) \\
&) * d / (c * f - d * e)) ^ {1/2} * \text{EllipticE}(((d * x + c) * f / (c * f - d * e)) ^ {1/2}, ((c * f - d * e) * h / f / (c * h - d * g)) ^ {1/2})) \\
& * b ^ 2 * d ^ 3 * e * f * g ^ 2 + x ^ 2 * b ^ 2 * d ^ 3 * f ^ 2 * g * h + x ^ 3 * b ^ 2 * d ^ 3 * f ^ 2 * h ^ 2 - ((\\
& d * x + c) * f / (c * f - d * e)) ^ {1/2} * (- (h * x + g) * d / (c * h - d * g)) ^ {1/2} * (- (f * x + e) * d / (c * f - d * e) \\
&)) ^ {1/2} * \text{EllipticE}(((d * x + c) * f / (c * f - d * e)) ^ {1/2}, ((c * f - d * e) * h / f / (c * h - d * g)) ^ {1/2})) \\
& * b ^ 2 * c ^ 3 * f ^ 2 * h ^ 2 + x * b ^ 2 * c * d ^ 2 * f ^ 2 * g * h + x * b ^ 2 * d ^ 3 * e * f * g * h + x * b ^ 2 * c * d ^ 2 * e * f * \\
& h ^ 2 - 3 * ((d * x + c) * f / (c * f - d * e)) ^ {1/2} * (- (h * x + g) * d / (c * h - d * g)) ^ {1/2} * (- (f * x + e) * d / \\
& (c * f - d * e)) ^ {1/2} * \text{EllipticE}(((d * x + c) * f / (c * f - d * e)) ^ {1/2}, ((c * f - d * e) * h / f / (c * h - d * g)) ^ {1/2})) \\
& * a * b * c * d ^ 2 * e * f * h ^ 2 - 3 * ((d * x + c) * f / (c * f - d * e)) ^ {1/2} * (- (h * x + g) * d / (c * h - d * g)) ^ {1/2} * (- (f * x + e) * d / (c * f - d * e)) ^ {1/2} \\
& * \text{EllipticE}(((d * x + c) * f / (c * f - d * e)) ^ {1/2}, ((c * f - d * e) * h / f / (c * h - d * g)) ^ {1/2})) * a * b * c * d ^ 2 * f ^ 2 * g * h + 3 * ((d * x + c) * f / (c * f \\
& - d * e)) ^ {1/2} * (- (h * x + g) * d / (c * h - d * g)) ^ {1/2} * (- (f * x + e) * d / (c * f - d * e)) ^ {1/2} * \text{EllipticE}(((d * x + c) * f / (c * f - d * e)) ^ {1/2}, ((c * f - d * e) * h / f / (c * h - d * g)) ^ {1/2})) \\
& * a * b * d ^ 3 * e * f * g * h - 3 * ((d * x + c) * f / (c * f - d * e)) ^ {1/2} * (- (h * x + g) * d / (c * h - d * g)) ^ {1/2} * (- (f * x + e) * d / (c * f - d * e)) ^ {1/2} * \text{EllipticPi}(((d * x + c) * f / (c * f - d * e)) ^ {1/2}, - (c * f - d * e) * b / f / (a * d - b * c), ((c * f - d * e) * h / f / (c * h - d * g)) ^ {1/2})) * a * b * d ^ 3 * e * f * g * h - 3 * ((d * x + c) * f / (c * f - d * e)) ^ {1/2} * (- (h * x + g) * d / (c * h - d * g)) ^ {1/2} * (- (f * x + e) * d / (c * f - d * e)) ^ {1/2} * \text{EllipticPi}(((d * x + c) * f / (c * f - d * e)) ^ {1/2}, - (c * f - d * e) * b / f / (a * d - b * c), ((c * f - d * e) * h / f / (c * h - d * g)) ^ {1/2})) * b ^ 2 * c * d ^ 2 * e * f * g * h - ((d * x + c) * f / (c * f - d * e)) ^ {1/2} * (- (h * x + g) * d / (c * h - d * g)) ^ {1/2} * (- (f * x + e) * d / (c * f - d * e)) ^ {1/2} * \text{EllipticF}(((d * x + c) * f / (c * f - d * e)) ^ {1/2}, ((c * f - d * e) * h / f / (c * h - d * g)) ^ {1/2})) * b ^ 2 * c * d ^ 2 * f ^ 2 * g ^ 2 - ((d * x + c) * f / (c * f - d * e)) ^ {1/2} * (- (h * x + g) * d / (c * h - d * g)) ^ {1/2} * (- (f * x + e) * d / (c * f - d * e)) ^ {1/2} * \text{EllipticF}(((d * x + c) * f / (c * f - d * e)) ^ {1/2}, ((c * f - d * e) * h / f / (c * h - d * g)) ^ {1/2})) * b ^ 2 * d ^ 3 * e ^ 2 * g * h + ((d * x + c) * f / (c * f - d * e)) ^ {1/2} * (- (h * x + g) * d / (c * h - d * g)) ^ {1/2} * (- (f * x + e) * d / (c * f - d * e)) ^ {1/2} * \text{EllipticF}(((d * x + c) * f / (c * f - d * e)) ^ {1/2}, ((c * f - d * e) * h / f / (c * h - d * g)) ^ {1/2})) * b ^ 2 * d ^ 3 * e * f * g ^ 2 * (d * x + c) ^ {1/2} * (f * x + e) ^ {1/2} * (h * x + g) ^ {1/2} / b ^ 3 / h / f / d ^ 2 / (d * f * h * x ^ 3 + c * f * h * x ^ 2 + d * e * h * x ^ 2 + d * f * g * x ^ 2 + c * e * h * x + c * f * g * x + d * e * g * x + c * e * g)
\end{aligned}$$

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{dx + c} \sqrt{fx + e} \sqrt{hx + g}}{bx + a} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d*x+c)^(1/2)*(f*x+e)^(1/2)*(h*x+g)^(1/2)/(b*x+a),x, algorithm="maxima")

[Out] integrate(sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)/(b*x + a), x)

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d*x+c)^(1/2)*(f*x+e)^(1/2)*(h*x+g)^(1/2)/(b*x+a),x, algorithm="fricas")

[Out] Timed out

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{c + dx}\sqrt{e + fx}\sqrt{g + hx}}{a + bx} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d*x+c)**(1/2)*(f*x+e)**(1/2)*(h*x+g)**(1/2)/(b*x+a),x)

[Out] Integral(sqrt(c + d*x)*sqrt(e + f*x)*sqrt(g + h*x)/(a + b*x), x)

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{dx + c}\sqrt{fx + e}\sqrt{hx + g}}{bx + a} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*x+c)^(1/2)*(f*x+e)^(1/2)*(h*x+g)^(1/2)/(b*x+a),x, algorithm="giac")
```

```
[Out] integrate(sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)/(b*x + a), x)
```

$$3.44 \quad \int \frac{\sqrt{2-3x}\sqrt{1+4x}(7+5x)^3}{\sqrt{-5+2x}} dx$$

Optimal. Leaf size=243

$$\frac{2161804579\sqrt{\frac{11}{6}}\sqrt{5-2x}\text{EllipticF}\left(\sin^{-1}\left(\sqrt{\frac{3}{11}}\sqrt{4x+1}\right), \frac{1}{3}\right)}{54432\sqrt{2x-5}} + \frac{1}{9}\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}(5x+7)^3 + \frac{1679}{756}\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}(5x+7)^2 + \frac{26291}{540}\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}(5x+7)$$

```
[Out] (46134551*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/38880 + (26291*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(7 + 5*x))/540 + (1679*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(7 + 5*x)^2)/756 + (Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(7 + 5*x)^3)/9 + (2629157597*Sqrt[11]*Sqrt[-5 + 2*x]*EllipticE[ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2])/(163296*Sqrt[5 - 2*x]) - (2161804579*Sqrt[11/6]*Sqrt[5 - 2*x]*EllipticF[ArcSin[Sqrt[3/11]*Sqrt[1 + 4*x]], 1/3])/(54432*Sqrt[-5 + 2*x])
```

Rubi [A] time = 0.296547, antiderivative size = 243, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 8, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}} = 0.229$, Rules used = {162, 1600, 1615, 158, 114, 113, 121, 119}

$$\frac{1}{9}\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}(5x+7)^3 + \frac{1679}{756}\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}(5x+7)^2 + \frac{26291}{540}\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}(5x+7)$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[2 - 3*x]*Sqrt[1 + 4*x]*(7 + 5*x)^3)/Sqrt[-5 + 2*x], x]
```

```
[Out] (46134551*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/38880 + (26291*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(7 + 5*x))/540 + (1679*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(7 + 5*x)^2)/756 + (Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(7 + 5*x)^3)/9 + (2629157597*Sqrt[11]*Sqrt[-5 + 2*x]*EllipticE[ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2])/(163296*Sqrt[5 - 2*x]) - (2161804579*Sqrt[11/6]*Sqrt[5 - 2*x]*EllipticF[ArcSin[Sqrt[3/11]*Sqrt[1 + 4*x]], 1/3])/(54432*Sqrt[-5 + 2*x])
```

Rule 162

```
Int[(((a_.) + (b_.)*(x_))^(m_)*Sqrt[(e_.) + (f_.)*(x_)])*Sqrt[(g_.) + (h_.)*(x_)])/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] := Simp[(2*(a + b*x)^m*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(d*(2*m + 3)), x] - Dist[1/(d*(2*m + 3)),
```

```

Int[((a + b*x)^(m - 1)/(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]))*Simp[2
*b*c*e*g*m + a*(c*(f*g + e*h) - 2*d*e*g*(m + 1)) - (b*(2*d*e*g - c*(f*g +
e*h)*(2*m + 1)) - a*(2*c*f*h - d*(2*m + 1)*(f*g + e*h)))*x - (2*a*d*f*h*m +
b*(d*(f*g + e*h) - 2*c*f*h*(m + 1)))*x^2, x], x] /; FreeQ[{a, b, c, d,
e, f, g, h, m}, x] && IntegerQ[2*m] && GtQ[m, 0]

```

Rule 1600

```

Int[(((a_.) + (b_.)*(x_))^(m_.)*((A_.) + (B_.)*(x_) + (C_.)*(x_)^2))/(Sqrt[
(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_S
ymbol] :> Simp[(2*C*(a + b*x)^m*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/
(d*f*h*(2*m + 3)), x] + Dist[1/(d*f*h*(2*m + 3)), Int[((a + b*x)^(m - 1)/(S
qrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]))*Simp[a*A*d*f*h*(2*m + 3) - C*(a*
(d*e*g + c*f*g + c*e*h) + 2*b*c*e*g*m) + ((A*b + a*B)*d*f*h*(2*m + 3) - C*(
2*a*(d*f*g + d*e*h + c*f*h) + b*(2*m + 1)*(d*e*g + c*f*g + c*e*h)))*x + (b*
B*d*f*h*(2*m + 3) + 2*C*(a*d*f*h*m - b*(m + 1)*(d*f*g + d*e*h + c*f*h)))*x^
2, x], x] /; FreeQ[{a, b, c, d, e, f, g, h, A, B, C}, x] && IntegerQ[2*
m] && GtQ[m, 0]

```

Rule 1615

```

Int[(Px_)*((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f
_.)*(x_))^(p_.), x_Symbol] :> With[{q = Expon[Px, x], k = Coeff[Px, x, Expo
n[Px, x]]}, Simp[(k*(a + b*x)^(m + q - 1)*(c + d*x)^(n + 1)*(e + f*x)^(p +
1))/(d*f*b^(q - 1)*(m + n + p + q + 1)), x] + Dist[1/(d*f*b^q*(m + n + p +
q + 1)), Int[(a + b*x)^m*(c + d*x)^n*(e + f*x)^p*ExpandToSum[d*f*b^q*(m + n
+ p + q + 1)*Px - d*f*k*(m + n + p + q + 1)*(a + b*x)^q + k*(a + b*x)^(q -
2)*(a^2*d*f*(m + n + p + q + 1) - b*(b*c*e*(m + q - 1) + a*(d*e*(n + 1) +
c*f*(p + 1))) + b*(a*d*f*(2*(m + q) + n + p) - b*(d*e*(m + q + n) + c*f*(m
+ q + p)))*x), x], x] /; NeQ[m + n + p + q + 1, 0] /; FreeQ[{a, b, c,
d, e, f, m, n, p}, x] && PolyQ[Px, x] && IntegersQ[2*m, 2*n, 2*p]

```

Rule 158

```

Int[((g_.) + (h_.)*(x_))/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]*
Sqrt[(e_.) + (f_.)*(x_)]), x_Symbol] :> Dist[h/f, Int[Sqrt[e + f*x]/(Sqrt[a
+ b*x]*Sqrt[c + d*x]), x], x] + Dist[(f*g - e*h)/f, Int[1/(Sqrt[a + b*x]*Sq
rt[c + d*x]*Sqrt[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x] &&
SimplerQ[a + b*x, e + f*x] && SimplerQ[c + d*x, e + f*x]

```

Rule 114

```

Int[Sqrt[(e_.) + (f_.)*(x_)]/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x
_)]), x_Symbol] :> Dist[(Sqrt[e + f*x]*Sqrt[(b*(c + d*x))/(b*c - a*d)])/(Sqr
t[c + d*x]*Sqrt[(b*(e + f*x))/(b*e - a*f)]), Int[Sqrt[(b*e)/(b*e - a*f)] + (

```



```
b*f*x)/(b*e - a*f)]/(Sqrt[a + b*x]*Sqrt[(b*c)/(b*c - a*d) + (b*d*x)/(b*c -
a*d)]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && !(GtQ[b/(b*c - a*d), 0]
&& GtQ[b/(b*e - a*f), 0]) && !LtQ[-((b*c - a*d)/d), 0]
```

Rule 113

```
Int[Sqrt[(e_.) + (f_.)*(x_)]/(Sqrt[(a_) + (b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_
)]), x_Symbol] :> Simp[(2*Rt[-((b*e - a*f)/d), 2]*EllipticE[ArcSin[Sqrt[a +
b*x]/Rt[-((b*c - a*d)/d), 2]], (f*(b*c - a*d))/(d*(b*e - a*f))]/b, x] /;
FreeQ[{a, b, c, d, e, f}, x] && GtQ[b/(b*c - a*d), 0] && GtQ[b/(b*e - a*f),
0] && !LtQ[-((b*c - a*d)/d), 0] && !(SimplerQ[c + d*x, a + b*x] && GtQ[-
(d/(b*c - a*d)), 0] && GtQ[d/(d*e - c*f), 0] && !LtQ[(b*c - a*d)/b, 0])
```

Rule 121

```
Int[1/(Sqrt[(a_) + (b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x
_)]), x_Symbol] :> Dist[Sqrt[(b*(c + d*x))/(b*c - a*d)]/Sqrt[c + d*x], Int[
1/(Sqrt[a + b*x]*Sqrt[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)]*Sqrt[e + f*x
]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && !GtQ[(b*c - a*d)/b, 0] && Si
mplerQ[a + b*x, c + d*x] && SimplerQ[a + b*x, e + f*x]
```

Rule 119

```
Int[1/(Sqrt[(a_) + (b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x
_)]), x_Symbol] :> Simp[(2*Rt[-(b/d), 2]*EllipticF[ArcSin[Sqrt[a + b*x]/(Rt
[-(b/d), 2]*Sqrt[(b*c - a*d)/b])], (f*(b*c - a*d))/(d*(b*e - a*f))]/(b*Sqr
t[(b*e - a*f)/b]), x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[(b*c - a*d)/b,
0] && GtQ[(b*e - a*f)/b, 0] && PosQ[-(b/d)] && !(SimplerQ[c + d*x, a + b*
x] && GtQ[(d*e - c*f)/d, 0] && GtQ[-(d/b), 0]) && !(SimplerQ[c + d*x, a +
b*x] && GtQ[(-(b*e) + a*f)/f, 0] && GtQ[-(f/b), 0]) && !(SimplerQ[e + f*x,
a + b*x] && GtQ[(-(d*e) + c*f)/f, 0] && GtQ[(-(b*e) + a*f)/f, 0] && (PosQ[
-(f/d)] || PosQ[-(f/b)]))
```

Rubi steps

$$\begin{aligned}
\int \frac{\sqrt{2-3x}\sqrt{1+4x}(7+5x)^3}{\sqrt{-5+2x}} dx &= \frac{1}{9}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^3 - \frac{1}{18} \int \frac{(7+5x)^2(-699-565x+3358x^2)}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}} dx \\
&= \frac{1679}{756}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^2 + \frac{1}{9}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^3 + \dots \\
&= \frac{26291}{540}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x) + \frac{1679}{756}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^2 \\
&= \frac{46134551\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{38880} + \frac{26291}{540}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x) + \frac{1679}{756}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^2 \\
&= \frac{46134551\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{38880} + \frac{26291}{540}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x) + \frac{1679}{756}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^2 \\
&= \frac{46134551\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{38880} + \frac{26291}{540}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x) + \frac{1679}{756}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^2 \\
&= \frac{46134551\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{38880} + \frac{26291}{540}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x) + \frac{1679}{756}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^2
\end{aligned}$$

Mathematica [A] time = 0.367859, size = 130, normalized size = 0.53

$$\frac{-2161804579\sqrt{66}\sqrt{5-2x}\text{EllipticF}\left(\sin^{-1}\left(\sqrt{\frac{3}{11}}\sqrt{4x+1}\right), \frac{1}{3}\right) + 6\sqrt{2-3x}\sqrt{4x+1}(1512000x^4 + 8614800x^3 + 21329208x^2 + 14800x + 1512000)}{326592\sqrt{2x-5}}$$

Antiderivative was successfully verified.

[In] Integrate[(Sqrt[2 - 3*x]*Sqrt[1 + 4*x]*(7 + 5*x)^3)/Sqrt[-5 + 2*x], x]

[Out] (6*Sqrt[2 - 3*x]*Sqrt[1 + 4*x]*(-455686385 + 51484034*x + 21329208*x^2 + 8614800*x^3 + 1512000*x^4) + 2629157597*Sqrt[66]*Sqrt[5 - 2*x]*EllipticE[ArcSin[Sqrt[3/11]*Sqrt[1 + 4*x]], 1/3] - 2161804579*Sqrt[66]*Sqrt[5 - 2*x]*EllipticF[ArcSin[Sqrt[3/11]*Sqrt[1 + 4*x]], 1/3])/(326592*Sqrt[-5 + 2*x])

Maple [A] time = 0.02, size = 155, normalized size = 0.6

$$\frac{1}{7838208x^3 - 22861440x^2 + 6858432x + 3265920}\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}\left(-108864000x^6 + 6485413737\sqrt{11}\sqrt{2-3x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `int((7+5*x)^3*(2-3*x)^(1/2)*(4*x+1)^(1/2)/(2*x-5)^(1/2),x)`

[Out]
$$-1/326592*(2-3*x)^{(1/2)}*(4*x+1)^{(1/2)}*(2*x-5)^{(1/2)}*(-108864000*x^6+6485413737*11^{(1/2)}*(2-3*x)^{(1/2)}*(5-2*x)^{(1/2)}*(4*x+1)^{(1/2)}*EllipticF(2/11*(22-33*x)^{(1/2)},1/2*I*2^{(1/2)})-5258315194*11^{(1/2)}*(2-3*x)^{(1/2)}*(5-2*x)^{(1/2)}*(4*x+1)^{(1/2)}*EllipticE(2/11*(22-33*x)^{(1/2)},1/2*I*2^{(1/2)})-574905600*x^5-1259114976*x^4-2963596608*x^3+34609891236*x^2-13052783142*x-5468236620)/(24*x^3-70*x^2+21*x+10)$$

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(5x+7)^3 \sqrt{4x+1} \sqrt{-3x+2}}{\sqrt{2x-5}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((7+5*x)^3*(2-3*x)^(1/2)*(1+4*x)^(1/2)/(-5+2*x)^(1/2),x, algorithm="maxima")`

[Out] `integrate((5*x + 7)^3*sqrt(4*x + 1)*sqrt(-3*x + 2)/sqrt(2*x - 5), x)`

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{(125x^3 + 525x^2 + 735x + 343)\sqrt{4x+1}\sqrt{-3x+2}}{\sqrt{2x-5}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((7+5*x)^3*(2-3*x)^(1/2)*(1+4*x)^(1/2)/(-5+2*x)^(1/2),x, algorithm="fricas")`

[Out] `integral((125*x^3 + 525*x^2 + 735*x + 343)*sqrt(4*x + 1)*sqrt(-3*x + 2)/sqrt(2*x - 5), x)`

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((7+5*x)**3*(2-3*x)**(1/2)*(1+4*x)**(1/2)/(-5+2*x)**(1/2), x)

[Out] Timed out

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(5x + 7)^3 \sqrt{4x + 1} \sqrt{-3x + 2}}{\sqrt{2x - 5}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((7+5*x)^3*(2-3*x)^(1/2)*(1+4*x)^(1/2)/(-5+2*x)^(1/2), x, algorithm="giac")

[Out] integrate((5*x + 7)^3*sqrt(4*x + 1)*sqrt(-3*x + 2)/sqrt(2*x - 5), x)

$$3.45 \quad \int \frac{\sqrt{2-3x}\sqrt{1+4x}(7+5x)^2}{\sqrt{-5+2x}} dx$$

Optimal. Leaf size=205

$$\frac{1679161\sqrt{\frac{11}{6}}\sqrt{5-2x}\text{EllipticF}\left(\sin^{-1}\left(\sqrt{\frac{3}{11}}\sqrt{4x+1}\right), \frac{1}{3}\right)}{756\sqrt{2x-5}} + \frac{1}{7}\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}(5x+7)^2 + \frac{173}{60}\sqrt{2-3x}\sqrt{2x-5}$$

```
[Out] (73207*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/1080 + (173*Sqrt[2 - 3*x]
]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(7 + 5*x))/60 + (Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]
]*Sqrt[1 + 4*x]*(7 + 5*x)^2)/7 + (8198333*Sqrt[11]*Sqrt[-5 + 2*x]*EllipticE
[ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2])/(9072*Sqrt[5 - 2*x]) - (1679161
*Sqrt[11/6]*Sqrt[5 - 2*x]*EllipticF[ArcSin[Sqrt[3/11]*Sqrt[1 + 4*x]], 1/3])
/(756*Sqrt[-5 + 2*x])
```

Rubi [A] time = 0.213009, antiderivative size = 205, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 8, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}} = 0.229$, Rules used = {162, 1600, 1615, 158, 114, 113, 121, 119}

$$\frac{1}{7}\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}(5x+7)^2 + \frac{173}{60}\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}(5x+7) + \frac{73207\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}}{1080} - \frac{1679161}{756\sqrt{2x-5}}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[2 - 3*x]*Sqrt[1 + 4*x]*(7 + 5*x)^2)/Sqrt[-5 + 2*x], x]
```

```
[Out] (73207*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/1080 + (173*Sqrt[2 - 3*x]
]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(7 + 5*x))/60 + (Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]
]*Sqrt[1 + 4*x]*(7 + 5*x)^2)/7 + (8198333*Sqrt[11]*Sqrt[-5 + 2*x]*EllipticE
[ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2])/(9072*Sqrt[5 - 2*x]) - (1679161
*Sqrt[11/6]*Sqrt[5 - 2*x]*EllipticF[ArcSin[Sqrt[3/11]*Sqrt[1 + 4*x]], 1/3])
/(756*Sqrt[-5 + 2*x])
```

Rule 162

```
Int[(((a_.) + (b_.)*(x_))^(m_)*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*
(x_)])/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[(2*(a + b*x)^m*Sqrt[c +
d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(d*(2*m + 3)), x] - Dist[1/(d*(2*m + 3)),
Int[((a + b*x)^(m - 1)/(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]))*Simp[2
*b*c*e*g*m + a*(c*(f*g + e*h) - 2*d*e*g*(m + 1)) - (b*(2*d*e*g - c*(f*g + e
```

```
*h)*(2*m + 1)) - a*(2*c*f*h - d*(2*m + 1)*(f*g + e*h))*x - (2*a*d*f*h*m +
b*(d*(f*g + e*h) - 2*c*f*h*(m + 1)))*x^2, x], x] /; FreeQ[{a, b, c, d,
e, f, g, h, m}, x] && IntegerQ[2*m] && GtQ[m, 0]
```

Rule 1600

```
Int[(((a_.) + (b_.)*(x_))^(m_.)*((A_.) + (B_.)*(x_) + (C_.)*(x_)^2))/(Sqrt[
(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_S
ymbol] := Simp[(2*C*(a + b*x)^m*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/
(d*f*h*(2*m + 3)), x] + Dist[1/(d*f*h*(2*m + 3)), Int[((a + b*x)^(m - 1)/(S
qrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]))*Simp[a*A*d*f*h*(2*m + 3) - C*(a*
(d*e*g + c*f*g + c*e*h) + 2*b*c*e*g*m) + ((A*b + a*B)*d*f*h*(2*m + 3) - C*(
2*a*(d*f*g + d*e*h + c*f*h) + b*(2*m + 1)*(d*e*g + c*f*g + c*e*h))*x + (b*
B*d*f*h*(2*m + 3) + 2*C*(a*d*f*h*m - b*(m + 1)*(d*f*g + d*e*h + c*f*h)))*x^
2, x], x], x] /; FreeQ[{a, b, c, d, e, f, g, h, A, B, C}, x] && IntegerQ[2*
m] && GtQ[m, 0]
```

Rule 1615

```
Int[(Px_)*((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f
_.)*(x_))^(p_.), x_Symbol] := With[{q = Expon[Px, x], k = Coeff[Px, x, Expo
n[Px, x]]}, Simp[(k*(a + b*x)^(m + q - 1)*(c + d*x)^(n + 1)*(e + f*x)^(p +
1))/(d*f*b^(q - 1)*(m + n + p + q + 1)), x] + Dist[1/(d*f*b^q*(m + n + p +
q + 1)), Int[(a + b*x)^m*(c + d*x)^n*(e + f*x)^p*ExpandToSum[d*f*b^q*(m + n
+ p + q + 1)*Px - d*f*k*(m + n + p + q + 1)*(a + b*x)^q + k*(a + b*x)^(q -
2)*(a^2*d*f*(m + n + p + q + 1) - b*(b*c*e*(m + q - 1) + a*(d*e*(n + 1) +
c*f*(p + 1))) + b*(a*d*f*(2*(m + q) + n + p) - b*(d*e*(m + q + n) + c*f*(m
+ q + p)))*x), x], x], x] /; NeQ[m + n + p + q + 1, 0] /; FreeQ[{a, b, c,
d, e, f, m, n, p}, x] && PolyQ[Px, x] && IntegersQ[2*m, 2*n, 2*p]
```

Rule 158

```
Int[((g_.) + (h_.)*(x_))/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]*
Sqrt[(e_.) + (f_.)*(x_)]), x_Symbol] := Dist[h/f, Int[Sqrt[e + f*x]/(Sqrt[a
+ b*x]*Sqrt[c + d*x]), x], x] + Dist[(f*g - e*h)/f, Int[1/(Sqrt[a + b*x]*Sq
rt[c + d*x]*Sqrt[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x] &&
SimplerQ[a + b*x, e + f*x] && SimplerQ[c + d*x, e + f*x]
```

Rule 114

```
Int[Sqrt[(e_.) + (f_.)*(x_)]/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x
_)]), x_Symbol] := Dist[(Sqrt[e + f*x]*Sqrt[(b*(c + d*x))/(b*c - a*d)])/(Sqr
t[c + d*x]*Sqrt[(b*(e + f*x))/(b*e - a*f)]), Int[Sqrt[(b*e)/(b*e - a*f) + (
b*f*x)/(b*e - a*f)]/(Sqrt[a + b*x]*Sqrt[(b*c)/(b*c - a*d) + (b*d*x)/(b*c -
a*d)]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && !(GtQ[b/(b*c - a*d), 0])
```

$\&\& \text{GtQ}[b/(b*e - a*f), 0] \&\& \text{!LtQ}[-(b*c - a*d)/d, 0]$

Rule 113

$\text{Int}[\text{Sqrt}[(e_{.}) + (f_{.})*(x_{.})]/(\text{Sqrt}[(a_{.}) + (b_{.})*(x_{.})]*\text{Sqrt}[(c_{.}) + (d_{.})*(x_{.})]), x_{\text{Symbol}}] \text{:>} \text{Simp}[(2*\text{Rt}[-(b*e - a*f)/d], 2)*\text{EllipticE}[\text{ArcSin}[\text{Sqrt}[a + b*x]/\text{Rt}[-(b*c - a*d)/d], 2]], (f*(b*c - a*d))/(d*(b*e - a*f))]/b, x] /;$
 $\text{FreeQ}\{a, b, c, d, e, f\}, x] \&\& \text{GtQ}[b/(b*c - a*d), 0] \&\& \text{GtQ}[b/(b*e - a*f), 0] \&\& \text{!LtQ}[-(b*c - a*d)/d, 0] \&\& \text{!(SimplerQ}[c + d*x, a + b*x] \&\& \text{GtQ}[-(d/(b*c - a*d)), 0] \&\& \text{GtQ}[d/(d*e - c*f), 0] \&\& \text{!LtQ}[(b*c - a*d)/b, 0])$

Rule 121

$\text{Int}[1/(\text{Sqrt}[(a_{.}) + (b_{.})*(x_{.})]*\text{Sqrt}[(c_{.}) + (d_{.})*(x_{.})]*\text{Sqrt}[(e_{.}) + (f_{.})*(x_{.})]), x_{\text{Symbol}}] \text{:>} \text{Dist}[\text{Sqrt}[(b*(c + d*x))/(b*c - a*d)]/\text{Sqrt}[c + d*x], \text{Int}[1/(\text{Sqrt}[a + b*x]*\text{Sqrt}[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)]*\text{Sqrt}[e + f*x]), x], x] /;$
 $\text{FreeQ}\{a, b, c, d, e, f\}, x] \&\& \text{!GtQ}[(b*c - a*d)/b, 0] \&\& \text{SimplerQ}[a + b*x, c + d*x] \&\& \text{SimplerQ}[a + b*x, e + f*x]$

Rule 119

$\text{Int}[1/(\text{Sqrt}[(a_{.}) + (b_{.})*(x_{.})]*\text{Sqrt}[(c_{.}) + (d_{.})*(x_{.})]*\text{Sqrt}[(e_{.}) + (f_{.})*(x_{.})]), x_{\text{Symbol}}] \text{:>} \text{Simp}[(2*\text{Rt}[-(b/d), 2]*\text{EllipticF}[\text{ArcSin}[\text{Sqrt}[a + b*x]/(\text{Rt}[-(b/d), 2]*\text{Sqrt}[(b*c - a*d)/b])], (f*(b*c - a*d))/(d*(b*e - a*f)))]/(b*\text{Sqrt}[(b*e - a*f)/b]), x] /;$
 $\text{FreeQ}\{a, b, c, d, e, f\}, x] \&\& \text{GtQ}[(b*c - a*d)/b, 0] \&\& \text{GtQ}[(b*e - a*f)/b, 0] \&\& \text{PosQ}[-(b/d)] \&\& \text{!(SimplerQ}[c + d*x, a + b*x] \&\& \text{GtQ}[(d*e - c*f)/d, 0] \&\& \text{GtQ}[-(d/b), 0]) \&\& \text{!(SimplerQ}[c + d*x, a + b*x] \&\& \text{GtQ}[(-(b*e) + a*f)/f, 0] \&\& \text{GtQ}[-(f/b), 0]) \&\& \text{!(SimplerQ}[e + f*x, a + b*x] \&\& \text{GtQ}[(-(d*e) + c*f)/f, 0] \&\& \text{GtQ}[(-(b*e) + a*f)/f, 0] \&\& (\text{PosQ}[-(f/d)] || \text{PosQ}[-(f/b)])]$

Rubi steps

$$\begin{aligned}
\int \frac{\sqrt{2-3x}\sqrt{1+4x}(7+5x)^2}{\sqrt{-5+2x}} dx &= \frac{1}{7}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^2 - \frac{1}{14} \int \frac{(7+5x)(-543-175x+2422x^2)}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}} dx \\
&= \frac{173}{60}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x) + \frac{1}{7}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^2 + \frac{\int 10}{7} \\
&= \frac{73207\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{1080} + \frac{173}{60}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x) + \frac{1}{7}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^2 \\
&= \frac{73207\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{1080} + \frac{173}{60}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x) + \frac{1}{7}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^2 \\
&= \frac{73207\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{1080} + \frac{173}{60}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x) + \frac{1}{7}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^2 \\
&= \frac{73207\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{1080} + \frac{173}{60}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x) + \frac{1}{7}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^2
\end{aligned}$$

Mathematica [A] time = 0.300078, size = 125, normalized size = 0.61

$$\frac{-6716644\sqrt{66}\sqrt{5-2x}\text{EllipticF}\left(\sin^{-1}\left(\sqrt{\frac{3}{11}}\sqrt{4x+1}\right), \frac{1}{3}\right) + 12\sqrt{2-3x}\sqrt{4x+1}\left(10800x^3 + 46836x^2 + 102592x - 717955\right)}{18144\sqrt{2x-5}}$$

Antiderivative was successfully verified.

[In] Integrate[(Sqrt[2 - 3*x]*Sqrt[1 + 4*x]*(7 + 5*x)^2)/Sqrt[-5 + 2*x], x]

[Out] (12*Sqrt[2 - 3*x]*Sqrt[1 + 4*x]*(-717955 + 102592*x + 46836*x^2 + 10800*x^3) + 8198333*Sqrt[66]*Sqrt[5 - 2*x]*EllipticE[ArcSin[Sqrt[3/11]*Sqrt[1 + 4*x]]], 1/3) - 6716644*Sqrt[66]*Sqrt[5 - 2*x]*EllipticF[ArcSin[Sqrt[3/11]*Sqrt[1 + 4*x]]], 1/3)/(18144*Sqrt[-5 + 2*x])

Maple [A] time = 0.012, size = 150, normalized size = 0.7

$$\frac{1}{217728x^3 - 635040x^2 + 190512x + 90720}\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}\left(10074966\sqrt{11}\sqrt{2-3x}\sqrt{5-2x}\sqrt{4x+1}\text{EllipticE}\left(\sin^{-1}\left(\sqrt{\frac{3}{11}}\sqrt{4x+1}\right), \frac{1}{3}\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `int((7+5*x)^2*(2-3*x)^(1/2)*(4*x+1)^(1/2)/(2*x-5)^(1/2),x)`

[Out] `-1/9072*(2-3*x)^(1/2)*(4*x+1)^(1/2)*(2*x-5)^(1/2)*(10074966*11^(1/2)*(2-3*x)^(1/2)*(5-2*x)^(1/2)*(4*x+1)^(1/2)*EllipticF(2/11*(22-33*x)^(1/2),1/2*I*2^(1/2))-8198333*11^(1/2)*(2-3*x)^(1/2)*(5-2*x)^(1/2)*(4*x+1)^(1/2)*EllipticE(2/11*(22-33*x)^(1/2),1/2*I*2^(1/2))-777600*x^5-3048192*x^4-5851944*x^3+55332552*x^2-20307546*x-8615460)/(24*x^3-70*x^2+21*x+10)`

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(5x+7)^2 \sqrt{4x+1} \sqrt{-3x+2}}{\sqrt{2x-5}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((7+5*x)^2*(2-3*x)^(1/2)*(1+4*x)^(1/2)/(-5+2*x)^(1/2),x, algorithm="maxima")`

[Out] `integrate((5*x + 7)^2*sqrt(4*x + 1)*sqrt(-3*x + 2)/sqrt(2*x - 5), x)`

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral} \left(\frac{(25x^2 + 70x + 49)\sqrt{4x+1}\sqrt{-3x+2}}{\sqrt{2x-5}}, x \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((7+5*x)^2*(2-3*x)^(1/2)*(1+4*x)^(1/2)/(-5+2*x)^(1/2),x, algorithm="fricas")`

[Out] `integral((25*x^2 + 70*x + 49)*sqrt(4*x + 1)*sqrt(-3*x + 2)/sqrt(2*x - 5), x)`

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((7+5*x)**2*(2-3*x)**(1/2)*(1+4*x)**(1/2)/(-5+2*x)**(1/2),x)

[Out] Timed out

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(5x+7)^2 \sqrt{4x+1} \sqrt{-3x+2}}{\sqrt{2x-5}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((7+5*x)^2*(2-3*x)^(1/2)*(1+4*x)^(1/2)/(-5+2*x)^(1/2),x, algorithm="giac")

[Out] integrate((5*x + 7)^2*sqrt(4*x + 1)*sqrt(-3*x + 2)/sqrt(2*x - 5), x)

$$3.46 \quad \int \frac{\sqrt{2-3x}\sqrt{1+4x}(7+5x)}{\sqrt{-5+2x}} dx$$

Optimal. Leaf size=162

$$\frac{4543\sqrt{\frac{11}{6}}\sqrt{5-2x}\text{EllipticF}\left(\sin^{-1}\left(\sqrt{\frac{3}{11}}\sqrt{4x+1}\right), \frac{1}{3}\right)}{36\sqrt{2x-5}} + \frac{1}{4}\sqrt{2-3x}\sqrt{2x-5}(4x+1)^{3/2} + \frac{95}{18}\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1} +$$

[Out] (95*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/18 + (Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*(1 + 4*x)^(3/2))/4 + (1397*Sqrt[11]*Sqrt[-5 + 2*x]*EllipticE[ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2])/(27*Sqrt[5 - 2*x]) - (4543*Sqrt[11/6]*Sqrt[5 - 2*x]*EllipticF[ArcSin[Sqrt[3/11]*Sqrt[1 + 4*x]], 1/3])/(36*Sqrt[-5 + 2*x])

Rubi [A] time = 0.0624533, antiderivative size = 162, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 6, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}} = 0.182$, Rules used = {154, 158, 114, 113, 121, 119}

$$\frac{1}{4}\sqrt{2-3x}\sqrt{2x-5}(4x+1)^{3/2} + \frac{95}{18}\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1} - \frac{4543\sqrt{\frac{11}{6}}\sqrt{5-2x}F\left(\sin^{-1}\left(\sqrt{\frac{3}{11}}\sqrt{4x+1}\right)\middle|\frac{1}{3}\right)}{36\sqrt{2x-5}} + \frac{1397\sqrt{11}}{27}$$

Antiderivative was successfully verified.

[In] Int[(Sqrt[2 - 3*x]*Sqrt[1 + 4*x]*(7 + 5*x))/Sqrt[-5 + 2*x], x]

[Out] (95*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/18 + (Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*(1 + 4*x)^(3/2))/4 + (1397*Sqrt[11]*Sqrt[-5 + 2*x]*EllipticE[ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2])/(27*Sqrt[5 - 2*x]) - (4543*Sqrt[11/6]*Sqrt[5 - 2*x]*EllipticF[ArcSin[Sqrt[3/11]*Sqrt[1 + 4*x]], 1/3])/(36*Sqrt[-5 + 2*x])

Rule 154

Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_)*((e_.) + (f_.)*(x_))^(p_)*((g_.) + (h_.)*(x_)), x_Symbol] := Simp[(h*(a + b*x)^m*(c + d*x)^(n + 1)*(e + f*x)^(p + 1))/(d*f*(m + n + p + 2)), x] + Dist[1/(d*f*(m + n + p + 2)), Int[(a + b*x)^(m - 1)*(c + d*x)^n*(e + f*x)^p*Simp[a*d*f*g*(m + n + p + 2) - h*(b*c*e*m + a*(d*e*(n + 1) + c*f*(p + 1))) + (b*d*f*g*(m + n + p + 2) + h*(a*d*f*m - b*(d*e*(m + n + 1) + c*f*(m + p + 1)))]*x, x], x] / ; FreeQ[{a, b, c, d, e, f, g, h, n, p}, x] && GtQ[m, 0] && NeQ[m + n + p +

2, 0] && IntegersQ[2*m, 2*n, 2*p]

Rule 158

Int[((g_.) + (h_.)*(x_))/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]), x_Symbol] :> Dist[h/f, Int[Sqrt[e + f*x]/(Sqrt[a + b*x]*Sqrt[c + d*x]), x], x] + Dist[(f*g - e*h)/f, Int[1/(Sqrt[a + b*x]*Sqrt[c + d*x]*Sqrt[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x] && SimplifierQ[a + b*x, e + f*x] && SimplifierQ[c + d*x, e + f*x]

Rule 114

Int[Sqrt[(e_.) + (f_.)*(x_)]/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]), x_Symbol] :> Dist[(Sqrt[e + f*x]*Sqrt[(b*(c + d*x))/(b*c - a*d)])/(Sqrt[c + d*x]*Sqrt[(b*(e + f*x))/(b*e - a*f)]), Int[Sqrt[(b*e)/(b*e - a*f) + (b*f*x)/(b*e - a*f)]/(Sqrt[a + b*x]*Sqrt[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && !(GtQ[b/(b*c - a*d), 0] && GtQ[b/(b*e - a*f), 0]) && !LtQ[-((b*c - a*d)/d), 0]

Rule 113

Int[Sqrt[(e_.) + (f_.)*(x_)]/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(2*Rt[-((b*e - a*f)/d), 2]*EllipticE[ArcSin[Sqrt[a + b*x]/Rt[-((b*c - a*d)/d), 2]], (f*(b*c - a*d))/(d*(b*e - a*f))]/b, x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[b/(b*c - a*d), 0] && GtQ[b/(b*e - a*f), 0] && !LtQ[-((b*c - a*d)/d), 0] && !(SimplerQ[c + d*x, a + b*x] && GtQ[-(d/(b*c - a*d)), 0] && GtQ[d/(d*e - c*f), 0] && !LtQ[(b*c - a*d)/b, 0])

Rule 121

Int[1/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]), x_Symbol] :> Dist[Sqrt[(b*(c + d*x))/(b*c - a*d)]/Sqrt[c + d*x], Int[1/(Sqrt[a + b*x]*Sqrt[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)]*Sqrt[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && !GtQ[(b*c - a*d)/b, 0] && SimplifierQ[a + b*x, c + d*x] && SimplifierQ[a + b*x, e + f*x]

Rule 119

Int[1/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]), x_Symbol] :> Simp[(2*Rt[-(b/d), 2]*EllipticF[ArcSin[Sqrt[a + b*x]/Rt[-(b/d), 2]*Sqrt[(b*c - a*d)/b]], (f*(b*c - a*d))/(d*(b*e - a*f))]/(b*Sqrt[(b*e - a*f)/b]), x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[(b*c - a*d)/b, 0] && GtQ[(b*e - a*f)/b, 0] && PosQ[-(b/d)] && !(SimplerQ[c + d*x, a + b*x] && GtQ[(d*e - c*f)/d, 0] && GtQ[-(d/b), 0]) && !(SimplerQ[c + d*x, a + b*x] && GtQ[-(b*e) + a*f, 0] && GtQ[-(f/b), 0]) && !(SimplerQ[e + f*x,

$a + b*x] \&\& \text{GtQ}[(-(d*e) + c*f)/f, 0] \&\& \text{GtQ}[(-(b*e) + a*f)/f, 0] \&\& (\text{PosQ}[-(f/d)] \mid\mid \text{PosQ}[-(f/b)]))$

Rubi steps

$$\begin{aligned} \int \frac{\sqrt{2-3x}\sqrt{1+4x}(7+5x)}{\sqrt{-5+2x}} dx &= \frac{1}{4}\sqrt{2-3x}\sqrt{-5+2x}(1+4x)^{3/2} + \frac{1}{20} \int \frac{\left(\frac{1065}{2} - 950x\right)\sqrt{1+4x}}{\sqrt{2-3x}\sqrt{-5+2x}} dx \\ &= \frac{95}{18}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x} + \frac{1}{4}\sqrt{2-3x}\sqrt{-5+2x}(1+4x)^{3/2} - \frac{1}{180} \int \frac{\frac{-29535}{2}}{\sqrt{2-3x}\sqrt{-5+2x}} dx \\ &= \frac{95}{18}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x} + \frac{1}{4}\sqrt{2-3x}\sqrt{-5+2x}(1+4x)^{3/2} - \frac{1397}{9} \int \frac{\sqrt{-5+2x}}{\sqrt{2-3x}\sqrt{1+4x}} dx \\ &= \frac{95}{18}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x} + \frac{1}{4}\sqrt{2-3x}\sqrt{-5+2x}(1+4x)^{3/2} - \frac{(4543\sqrt{\frac{11}{2}}\sqrt{5-2x})}{36\sqrt{2-3x}\sqrt{1+4x}} \\ &= \frac{95}{18}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x} + \frac{1}{4}\sqrt{2-3x}\sqrt{-5+2x}(1+4x)^{3/2} + \frac{1397\sqrt{11}\sqrt{-5+2x}}{27\sqrt{2-3x}\sqrt{1+4x}} \end{aligned}$$

Mathematica [A] time = 0.192639, size = 120, normalized size = 0.74

$$\frac{-4543\sqrt{66}\sqrt{5-2x}\text{EllipticF}\left(\sin^{-1}\left(\sqrt{\frac{3}{11}}\sqrt{4x+1}\right), \frac{1}{3}\right) + 6\sqrt{2-3x}\sqrt{4x+1}(72x^2 + 218x - 995) + 5588\sqrt{66}\sqrt{5-2x}\text{E}}{216\sqrt{2x-5}}$$

Antiderivative was successfully verified.

[In] Integrate[(Sqrt[2 - 3*x]*Sqrt[1 + 4*x]*(7 + 5*x))/Sqrt[-5 + 2*x], x]

[Out] (6*Sqrt[2 - 3*x]*Sqrt[1 + 4*x]*(-995 + 218*x + 72*x^2) + 5588*Sqrt[66]*Sqrt[5 - 2*x]*EllipticE[ArcSin[Sqrt[3/11]*Sqrt[1 + 4*x]], 1/3] - 4543*Sqrt[66]*Sqrt[5 - 2*x]*EllipticF[ArcSin[Sqrt[3/11]*Sqrt[1 + 4*x]], 1/3])/(216*Sqrt[-5 + 2*x])

Maple [A] time = 0.01, size = 145, normalized size = 0.9

$$\frac{1}{5184x^3 - 15120x^2 + 4536x + 2160}\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}\left(13629\sqrt{11}\sqrt{2-3x}\sqrt{5-2x}\sqrt{4x+1}\text{EllipticF}\left(\frac{2}{11}\sqrt{\frac{3}{11}}\sqrt{4x+1}, \frac{1}{3}\right) + 6\sqrt{2-3x}\sqrt{4x+1}(72x^2 + 218x - 995) + 5588\sqrt{66}\sqrt{5-2x}\text{E}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `int((7+5*x)*(2-3*x)^(1/2)*(4*x+1)^(1/2)/(2*x-5)^(1/2),x)`

[Out]
$$-1/216*(2-3*x)^{(1/2)}*(4*x+1)^{(1/2)}*(2*x-5)^{(1/2)}*(13629*11^{(1/2)}*(2-3*x)^{(1/2)}*(5-2*x)^{(1/2)}*(4*x+1)^{(1/2)}*\text{EllipticF}(2/11*(22-33*x)^{(1/2)},1/2*I*2^{(1/2)})-11176*11^{(1/2)}*(2-3*x)^{(1/2)}*(5-2*x)^{(1/2)}*(4*x+1)^{(1/2)}*\text{EllipticE}(2/11*(22-33*x)^{(1/2)},1/2*I*2^{(1/2)})-5184*x^4-13536*x^3+79044*x^2-27234*x-11940)/(24*x^3-70*x^2+21*x+10)$$

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(5x+7)\sqrt{4x+1}\sqrt{-3x+2}}{\sqrt{2x-5}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((7+5*x)*(2-3*x)^(1/2)*(1+4*x)^(1/2)/(-5+2*x)^(1/2),x, algorithm="maxima")`

[Out] `integrate((5*x + 7)*sqrt(4*x + 1)*sqrt(-3*x + 2)/sqrt(2*x - 5), x)`

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{(5x+7)\sqrt{4x+1}\sqrt{-3x+2}}{\sqrt{2x-5}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((7+5*x)*(2-3*x)^(1/2)*(1+4*x)^(1/2)/(-5+2*x)^(1/2),x, algorithm="fricas")`

[Out] `integral((5*x + 7)*sqrt(4*x + 1)*sqrt(-3*x + 2)/sqrt(2*x - 5), x)`

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{2-3x}\sqrt{4x+1}(5x+7)}{\sqrt{2x-5}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((7+5*x)*(2-3*x)**(1/2)*(1+4*x)**(1/2)/(-5+2*x)**(1/2),x)`

[Out] `Integral(sqrt(2 - 3*x)*sqrt(4*x + 1)*(5*x + 7)/sqrt(2*x - 5), x)`

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(5x + 7)\sqrt{4x + 1}\sqrt{-3x + 2}}{\sqrt{2x - 5}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((7+5*x)*(2-3*x)^(1/2)*(1+4*x)^(1/2)/(-5+2*x)^(1/2),x, algorithm="giac")`

[Out] `integrate((5*x + 7)*sqrt(4*x + 1)*sqrt(-3*x + 2)/sqrt(2*x - 5), x)`

$$3.47 \quad \int \frac{\sqrt{2-3x}\sqrt{1+4x}}{\sqrt{-5+2x}} dx$$

Optimal. Leaf size=131

$$\frac{11\sqrt{\frac{22}{3}}\sqrt{5-2x}\text{EllipticF}\left(\sin^{-1}\left(\sqrt{\frac{3}{11}}\sqrt{4x+1}\right), \frac{1}{3}\right)}{3\sqrt{2x-5}} + \frac{1}{3}\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1} + \frac{55\sqrt{11}\sqrt{2x-5}E\left(\sin^{-1}\left(\frac{2\sqrt{2-3x}}{\sqrt{11}}\right)\right)}{18\sqrt{5-2x}}$$

```
[Out] (Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/3 + (55*Sqrt[11]*Sqrt[-5 + 2*x]
]*EllipticE[ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2])/(18*Sqrt[5 - 2*x]) -
(11*Sqrt[22/3]*Sqrt[5 - 2*x]*EllipticF[ArcSin[Sqrt[3/11]*Sqrt[1 + 4*x]], 1
/3])/(3*Sqrt[-5 + 2*x])
```

Rubi [A] time = 0.0513602, antiderivative size = 131, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}} = 0.214$, Rules used = {101, 158, 114, 113, 121, 119}

$$\frac{1}{3}\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1} - \frac{11\sqrt{\frac{22}{3}}\sqrt{5-2x}F\left(\sin^{-1}\left(\sqrt{\frac{3}{11}}\sqrt{4x+1}\right)\middle|\frac{1}{3}\right)}{3\sqrt{2x-5}} + \frac{55\sqrt{11}\sqrt{2x-5}E\left(\sin^{-1}\left(\frac{2\sqrt{2-3x}}{\sqrt{11}}\right)\middle|-\frac{1}{2}\right)}{18\sqrt{5-2x}}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[2 - 3*x]*Sqrt[1 + 4*x])/Sqrt[-5 + 2*x], x]
```

```
[Out] (Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/3 + (55*Sqrt[11]*Sqrt[-5 + 2*x]
]*EllipticE[ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2])/(18*Sqrt[5 - 2*x]) -
(11*Sqrt[22/3]*Sqrt[5 - 2*x]*EllipticF[ArcSin[Sqrt[3/11]*Sqrt[1 + 4*x]], 1
/3])/(3*Sqrt[-5 + 2*x])
```

Rule 101

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x
_))^(p_.), x_Symbol] :> Simp[((a + b*x)^m*(c + d*x)^n*(e + f*x)^(p + 1))/(f
*(m + n + p + 1)), x] - Dist[1/(f*(m + n + p + 1)), Int[(a + b*x)^(m - 1)*(
c + d*x)^(n - 1)*(e + f*x)^p*Simp[c*m*(b*e - a*f) + a*n*(d*e - c*f) + (d*m*
(b*e - a*f) + b*n*(d*e - c*f))*x, x], x] /; FreeQ[{a, b, c, d, e, f, p}
, x] && GtQ[m, 0] && GtQ[n, 0] && NeQ[m + n + p + 1, 0] && (IntegersQ[2*m,
2*n, 2*p] || (IntegersQ[m, n + p] || IntegersQ[p, m + n]))
```

Rule 158


```
Int[((g_.) + (h_.)*(x_))/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]*
Sqrt[(e_.) + (f_.)*(x_)]), x_Symbol] := Dist[h/f, Int[Sqrt[e + f*x]/(Sqrt[a
+ b*x]*Sqrt[c + d*x]), x], x] + Dist[(f*g - e*h)/f, Int[1/(Sqrt[a + b*x]*Sq
rt[c + d*x]*Sqrt[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x] &&
SimplerQ[a + b*x, e + f*x] && SimplerQ[c + d*x, e + f*x]
```

Rule 114

```
Int[Sqrt[(e_.) + (f_.)*(x_)]/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_
)]), x_Symbol] := Dist[(Sqrt[e + f*x]*Sqrt[(b*(c + d*x))/(b*c - a*d)])/(Sqr
t[c + d*x]*Sqrt[(b*(e + f*x))/(b*e - a*f)]), Int[Sqrt[(b*e)/(b*e - a*f) + (
b*f*x)/(b*e - a*f)]/(Sqrt[a + b*x]*Sqrt[(b*c)/(b*c - a*d) + (b*d*x)/(b*c -
a*d)]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && !(GtQ[b/(b*c - a*d), 0]
&& GtQ[b/(b*e - a*f), 0]) && !LtQ[-((b*c - a*d)/d), 0]
```

Rule 113

```
Int[Sqrt[(e_.) + (f_.)*(x_)]/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_
)]), x_Symbol] := Simp[(2*Rt[-((b*e - a*f)/d), 2]*EllipticE[ArcSin[Sqrt[a +
b*x]/Rt[-((b*c - a*d)/d), 2]], (f*(b*c - a*d))/(d*(b*e - a*f)))]/b, x] /;
FreeQ[{a, b, c, d, e, f}, x] && GtQ[b/(b*c - a*d), 0] && GtQ[b/(b*e - a*f),
0] && !LtQ[-((b*c - a*d)/d), 0] && !(SimplerQ[c + d*x, a + b*x] && GtQ[-
(d/(b*c - a*d)), 0] && GtQ[d/(d*e - c*f), 0] && !LtQ[(b*c - a*d)/b, 0])
```

Rule 121

```
Int[1/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x
_)]), x_Symbol] := Dist[Sqrt[(b*(c + d*x))/(b*c - a*d)]/Sqrt[c + d*x], Int[
1/(Sqrt[a + b*x]*Sqrt[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)]*Sqrt[e + f*x
]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && !GtQ[(b*c - a*d)/b, 0] && Si
mplerQ[a + b*x, c + d*x] && SimplerQ[a + b*x, e + f*x]
```

Rule 119

```
Int[1/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x
_)]), x_Symbol] := Simp[(2*Rt[-(b/d), 2]*EllipticF[ArcSin[Sqrt[a + b*x]/(Rt
[-(b/d), 2]*Sqrt[(b*c - a*d)/b])], (f*(b*c - a*d))/(d*(b*e - a*f)))]/(b*Sqr
t[(b*e - a*f)/b]), x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[(b*c - a*d)/b,
0] && GtQ[(b*e - a*f)/b, 0] && PosQ[-(b/d)] && !(SimplerQ[c + d*x, a + b*
x] && GtQ[(d*e - c*f)/d, 0] && GtQ[-(d/b), 0]) && !(SimplerQ[c + d*x, a +
b*x] && GtQ[(-(b*e) + a*f)/f, 0] && GtQ[-(f/b), 0]) && !(SimplerQ[e + f*x,
a + b*x] && GtQ[(-(d*e) + c*f)/f, 0] && GtQ[(-(b*e) + a*f)/f, 0] && (PosQ[
-(f/d)] || PosQ[-(f/b)]))
```

Rubi steps

$$\begin{aligned}
\int \frac{\sqrt{2-3x}\sqrt{1+4x}}{\sqrt{-5+2x}} dx &= \frac{1}{3} \sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x} - \frac{1}{3} \int \frac{-\frac{33}{2} + 55x}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}} dx \\
&= \frac{1}{3} \sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x} - \frac{55}{6} \int \frac{\sqrt{-5+2x}}{\sqrt{2-3x}\sqrt{1+4x}} dx - \frac{121}{3} \int \frac{1}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}} dx \\
&= \frac{1}{3} \sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x} - \frac{(11\sqrt{22}\sqrt{5-2x}) \int \frac{1}{\sqrt{2-3x}\sqrt{\frac{10}{11}-\frac{4x}{11}}\sqrt{1+4x}} dx}{3\sqrt{-5+2x}} - \frac{(55\sqrt{-5+2x}) \int \frac{1}{\sqrt{2-3x}\sqrt{1+4x}} dx}{6\sqrt{5-2x}} \\
&= \frac{1}{3} \sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x} + \frac{55\sqrt{11}\sqrt{-5+2x}E\left(\sin^{-1}\left(\frac{2\sqrt{2-3x}}{\sqrt{11}}\right) \middle| -\frac{1}{2}\right)}{18\sqrt{5-2x}} - \frac{11\sqrt{\frac{22}{3}}\sqrt{5-2x}F\left(\sin^{-1}\left(\frac{2\sqrt{2-3x}}{\sqrt{11}}\right) \middle| -\frac{1}{2}\right)}{3\sqrt{-5+2x}}
\end{aligned}$$

Mathematica [A] time = 0.186648, size = 115, normalized size = 0.88

$$\frac{-44\sqrt{66}\sqrt{5-2x}\text{EllipticF}\left(\sin^{-1}\left(\sqrt{\frac{3}{11}}\sqrt{4x+1}\right), \frac{1}{3}\right) + 12\sqrt{2-3x}\sqrt{4x+1}(2x-5) + 55\sqrt{66}\sqrt{5-2x}E\left(\sin^{-1}\left(\sqrt{\frac{3}{11}}\sqrt{4x+1}\right), \frac{1}{3}\right)}{36\sqrt{2x-5}}$$

Antiderivative was successfully verified.

[In] Integrate[(Sqrt[2 - 3*x]*Sqrt[1 + 4*x])/Sqrt[-5 + 2*x], x]

[Out] (12*Sqrt[2 - 3*x]*(-5 + 2*x)*Sqrt[1 + 4*x] + 55*Sqrt[66]*Sqrt[5 - 2*x]*EllipticE[ArcSin[Sqrt[3/11]*Sqrt[1 + 4*x]], 1/3] - 44*Sqrt[66]*Sqrt[5 - 2*x]*EllipticF[ArcSin[Sqrt[3/11]*Sqrt[1 + 4*x]], 1/3])/(36*Sqrt[-5 + 2*x])

Maple [A] time = 0.007, size = 140, normalized size = 1.1

$$-\frac{1}{432x^3 - 1260x^2 + 378x + 180} \sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1} \left(66\sqrt{11}\sqrt{2-3x}\sqrt{5-2x}\sqrt{4x+1}\text{EllipticF}\left(\frac{2}{11}\sqrt{22-33x}, \frac{1}{2}\right) - 55\sqrt{66}\sqrt{5-2x}E\left(\sin^{-1}\left(\sqrt{\frac{3}{11}}\sqrt{4x+1}\right), \frac{1}{3}\right) \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((2-3*x)^(1/2)*(4*x+1)^(1/2)/(2*x-5)^(1/2), x)

[Out] -1/18*(2-3*x)^(1/2)*(4*x+1)^(1/2)*(2*x-5)^(1/2)*(66*11^(1/2)*(2-3*x)^(1/2)*(5-2*x)^(1/2)*(4*x+1)^(1/2)*EllipticF(2/11*(22-33*x)^(1/2), 1/2*I*2^(1/2))-55*sqrt(66)*sqrt(5-2*x)*E(sin^-1(sqrt(3/11)*sqrt(4*x+1)), 1/3))

$5 \cdot 11^{1/2} \cdot (2-3x)^{1/2} \cdot (5-2x)^{1/2} \cdot (4x+1)^{1/2} \cdot \text{EllipticE}(2/11 \cdot (22-33x)^{1/2}, 1/2 \cdot I \cdot 2^{1/2}) - 144x^3 + 420x^2 - 126x - 60) / (24x^3 - 70x^2 + 21x + 10)$

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{4x+1}\sqrt{-3x+2}}{\sqrt{2x-5}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2-3*x)^(1/2)*(1+4*x)^(1/2)/(-5+2*x)^(1/2),x, algorithm="maxima")

[Out] integrate(sqrt(4*x + 1)*sqrt(-3*x + 2)/sqrt(2*x - 5), x)

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{4x+1}\sqrt{-3x+2}}{\sqrt{2x-5}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2-3*x)^(1/2)*(1+4*x)^(1/2)/(-5+2*x)^(1/2),x, algorithm="fricas")

[Out] integral(sqrt(4*x + 1)*sqrt(-3*x + 2)/sqrt(2*x - 5), x)

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{2-3x}\sqrt{4x+1}}{\sqrt{2x-5}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2-3*x)**(1/2)*(1+4*x)**(1/2)/(-5+2*x)**(1/2),x)

[Out] Integral(sqrt(2 - 3*x)*sqrt(4*x + 1)/sqrt(2*x - 5), x)

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{4x+1}\sqrt{-3x+2}}{\sqrt{2x-5}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((2-3*x)^(1/2)*(1+4*x)^(1/2)/(-5+2*x)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(sqrt(4*x + 1)*sqrt(-3*x + 2)/sqrt(2*x - 5), x)
```

$$3.48 \quad \int \frac{\sqrt{2-3x}\sqrt{1+4x}}{\sqrt{-5+2x}(7+5x)} dx$$

Optimal. Leaf size=151

$$\frac{41\sqrt{\frac{2}{33}}\sqrt{5-2x}\text{EllipticF}\left(\sin^{-1}\left(\sqrt{\frac{3}{11}}\sqrt{4x+1}\right), \frac{1}{3}\right)}{25\sqrt{2x-5}} + \frac{2\sqrt{11}\sqrt{2x-5}E\left(\sin^{-1}\left(\frac{2\sqrt{2-3x}}{\sqrt{11}}\right)\middle|-\frac{1}{2}\right)}{5\sqrt{5-2x}} + \frac{69\sqrt{5-2x}\Pi\left(\frac{55}{124}; \sin^{-1}\left(\frac{2\sqrt{2-3x}}{\sqrt{11}}\right)\right)}{25\sqrt{11}\sqrt{2x-5}}$$

[Out] (2*Sqrt[11]*Sqrt[-5 + 2*x]*EllipticE[ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2])/(5*Sqrt[5 - 2*x]) - (41*Sqrt[2/33]*Sqrt[5 - 2*x]*EllipticF[ArcSin[Sqrt[3/11]*Sqrt[1 + 4*x]], 1/3])/(25*Sqrt[-5 + 2*x]) + (69*Sqrt[5 - 2*x]*EllipticPi[55/124, ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2])/(25*Sqrt[11]*Sqrt[-5 + 2*x])

Rubi [A] time = 0.121094, antiderivative size = 151, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 9, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}} = 0.257$, Rules used = {163, 168, 538, 537, 158, 114, 113, 121, 119}

$$\frac{41\sqrt{\frac{2}{33}}\sqrt{5-2x}F\left(\sin^{-1}\left(\sqrt{\frac{3}{11}}\sqrt{4x+1}\right)\middle|\frac{1}{3}\right)}{25\sqrt{2x-5}} + \frac{2\sqrt{11}\sqrt{2x-5}E\left(\sin^{-1}\left(\frac{2\sqrt{2-3x}}{\sqrt{11}}\right)\middle|-\frac{1}{2}\right)}{5\sqrt{5-2x}} + \frac{69\sqrt{5-2x}\Pi\left(\frac{55}{124}; \sin^{-1}\left(\frac{2\sqrt{2-3x}}{\sqrt{11}}\right)\right)}{25\sqrt{11}\sqrt{2x-5}}$$

Antiderivative was successfully verified.

[In] Int[(Sqrt[2 - 3*x]*Sqrt[1 + 4*x])/(Sqrt[-5 + 2*x]*(7 + 5*x)), x]

[Out] (2*Sqrt[11]*Sqrt[-5 + 2*x]*EllipticE[ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2])/(5*Sqrt[5 - 2*x]) - (41*Sqrt[2/33]*Sqrt[5 - 2*x]*EllipticF[ArcSin[Sqrt[3/11]*Sqrt[1 + 4*x]], 1/3])/(25*Sqrt[-5 + 2*x]) + (69*Sqrt[5 - 2*x]*EllipticPi[55/124, ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2])/(25*Sqrt[11]*Sqrt[-5 + 2*x])

Rule 163

Int[(Sqrt[(e_.) + (f_.)*(x_.)]*Sqrt[(g_.) + (h_.)*(x_.)])/(((a_.) + (b_.)*(x_.))*Sqrt[(c_.) + (d_.)*(x_.)]), x_Symbol] := Dist[((b*e - a*f)*(b*g - a*h))/b^2, Int[1/((a + b*x)*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]), x], x] + Dist[1/b^2, Int[Simp[b*f*g + b*e*h - a*f*h + b*f*h*x, x]/(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]), x], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x]

Rule 168

```
Int[1/(((a_.) + (b_.)*(x_))*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Dist[-2, Subst[Int[1/(Simp[b*c - a*d - b*x^2, x]*Sqrt[Simp[(d*e - c*f)/d + (f*x^2)/d, x]]*Sqrt[Simp[(d*g - c*h)/d + (h*x^2)/d, x]]), x], x, Sqrt[c + d*x]], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x] && GtQ[(d*e - c*f)/d, 0]
```

Rule 538

```
Int[1/(((a_) + (b_.)*(x_)^2)*Sqrt[(c_) + (d_.)*(x_)^2]*Sqrt[(e_) + (f_.)*(x_)^2]), x_Symbol] := Dist[Sqrt[1 + (d*x^2)/c]/Sqrt[c + d*x^2], Int[1/((a + b*x^2)*Sqrt[1 + (d*x^2)/c]*Sqrt[e + f*x^2]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && !GtQ[c, 0]
```

Rule 537

```
Int[1/(((a_) + (b_.)*(x_)^2)*Sqrt[(c_) + (d_.)*(x_)^2]*Sqrt[(e_) + (f_.)*(x_)^2]), x_Symbol] := Simp[(1*EllipticPi[(b*c)/(a*d), ArcSin[Rt[-(d/c), 2]*x], (c*f)/(d*e)]/(a*Sqrt[c]*Sqrt[e]*Rt[-(d/c), 2]), x] /; FreeQ[{a, b, c, d, e, f}, x] && !GtQ[d/c, 0] && GtQ[c, 0] && GtQ[e, 0] && !( !GtQ[f/e, 0] && SimplersqrtQ[-(f/e), -(d/c)])
```

Rule 158

```
Int[((g_.) + (h_.)*(x_))/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x_)]), x_Symbol] := Dist[h/f, Int[Sqrt[e + f*x]/(Sqrt[a + b*x]*Sqrt[c + d*x]), x], x] + Dist[(f*g - e*h)/f, Int[1/(Sqrt[a + b*x]*Sqrt[c + d*x]*Sqrt[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x] && SimplersqrtQ[a + b*x, e + f*x] && SimplersqrtQ[c + d*x, e + f*x]
```

Rule 114

```
Int[Sqrt[(e_.) + (f_.)*(x_)]/(Sqrt[(a_) + (b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]), x_Symbol] := Dist[(Sqrt[e + f*x]*Sqrt[(b*(c + d*x))/(b*c - a*d)]/(Sqrt[c + d*x]*Sqrt[(b*(e + f*x))/(b*e - a*f)]), Int[Sqrt[(b*e)/(b*e - a*f) + (b*f*x)/(b*e - a*f)]/(Sqrt[a + b*x]*Sqrt[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && !(GtQ[b/(b*c - a*d), 0] && GtQ[b/(b*e - a*f), 0]) && !LtQ[-((b*c - a*d)/d), 0]
```

Rule 113

```
Int[Sqrt[(e_.) + (f_.)*(x_)]/(Sqrt[(a_) + (b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]), x_Symbol] := Simp[(2*Rt[-((b*e - a*f)/d), 2]*EllipticE[ArcSin[Sqrt[a + b*x]/Rt[-((b*c - a*d)/d), 2]], (f*(b*c - a*d))/(d*(b*e - a*f))]/b, x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[b/(b*c - a*d), 0] && GtQ[b/(b*e - a*f), 0] && !LtQ[-((b*c - a*d)/d), 0] && !(SimplersqrtQ[c + d*x, a + b*x] && GtQ[-
```

$(d/(b*c - a*d)), 0]$ && $GtQ[d/(d*e - c*f), 0]$ && $!LtQ[(b*c - a*d)/b, 0]$

Rule 121

$Int[1/(Sqrt[(a_) + (b_)*(x_)]*Sqrt[(c_) + (d_)*(x_)]*Sqrt[(e_) + (f_)*(x_)]), x_Symbol] :> Dist[Sqrt[(b*(c + d*x))/(b*c - a*d)]/Sqrt[c + d*x], Int[1/(Sqrt[a + b*x]*Sqrt[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)]*Sqrt[e + f*x]), x], x] /;$ $FreeQ[\{a, b, c, d, e, f\}, x]$ && $!GtQ[(b*c - a*d)/b, 0]$ && $SimplerQ[a + b*x, c + d*x]$ && $SimplerQ[a + b*x, e + f*x]$

Rule 119

$Int[1/(Sqrt[(a_) + (b_)*(x_)]*Sqrt[(c_) + (d_)*(x_)]*Sqrt[(e_) + (f_)*(x_)]), x_Symbol] :> Simp[(2*Rt[-(b/d), 2]*EllipticF[ArcSin[Sqrt[a + b*x]/(Rt[-(b/d), 2]*Sqrt[(b*c - a*d)/b])], (f*(b*c - a*d))/(d*(b*e - a*f)))]/(b*Sqrt[(b*e - a*f)/b]), x] /;$ $FreeQ[\{a, b, c, d, e, f\}, x]$ && $GtQ[(b*c - a*d)/b, 0]$ && $GtQ[(b*e - a*f)/b, 0]$ && $PosQ[-(b/d)]$ && $!(SimplerQ[c + d*x, a + b*x])$ && $GtQ[(d*e - c*f)/d, 0]$ && $GtQ[-(d/b), 0]$ && $!(SimplerQ[c + d*x, a + b*x])$ && $GtQ[(-(b*e) + a*f)/f, 0]$ && $GtQ[-(f/b), 0]$ && $!(SimplerQ[e + f*x, a + b*x])$ && $GtQ[(-(d*e) + c*f)/f, 0]$ && $GtQ[(-(b*e) + a*f)/f, 0]$ && $(PosQ[-(f/d)] || PosQ[-(f/b)])$

Rubi steps

$$\begin{aligned} \int \frac{\sqrt{2-3x}\sqrt{1+4x}}{\sqrt{-5+2x}(7+5x)} dx &= \frac{1}{25} \int \frac{109-60x}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}} dx - \frac{713}{25} \int \frac{1}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)} dx \\ &= -\left(\frac{6}{5} \int \frac{\sqrt{-5+2x}}{\sqrt{2-3x}\sqrt{1+4x}} dx\right) - \frac{41}{25} \int \frac{1}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}} dx + \frac{1426}{25} \text{Subst} \left[\int \frac{1}{(31-5x^2)\sqrt{\frac{11}{3}-\frac{4x^2}{3}}} dx \right. \\ &= -\frac{\left(41\sqrt{\frac{2}{11}}\sqrt{5-2x}\right) \int \frac{1}{\sqrt{2-3x}\sqrt{\frac{10}{11}-\frac{4x}{11}}\sqrt{1+4x}} dx}{25\sqrt{-5+2x}} + \frac{\left(1426\sqrt{\frac{3}{11}}\sqrt{5-2x}\right) \text{Subst} \left[\int \frac{1}{(31-5x^2)\sqrt{\frac{11}{3}-\frac{4x^2}{3}}} dx \right]}{25\sqrt{-5+2x}} \\ &= \frac{2\sqrt{11}\sqrt{-5+2x}E\left(\sin^{-1}\left(\frac{2\sqrt{2-3x}}{\sqrt{11}}\right) \middle| -\frac{1}{2}\right)}{5\sqrt{5-2x}} - \frac{41\sqrt{\frac{2}{33}}\sqrt{5-2x}F\left(\sin^{-1}\left(\sqrt{\frac{3}{11}}\sqrt{1+4x}\right) \middle| \frac{1}{3}\right)}{25\sqrt{-5+2x}} + \frac{69\sqrt{5-2x}}{25\sqrt{22x-55}} \end{aligned}$$

Mathematica [A] time = 0.403959, size = 97, normalized size = 0.64

$$\frac{\sqrt{5-2x} \left(41 \text{EllipticF} \left(\sin^{-1} \left(\frac{2\sqrt{2-3x}}{\sqrt{11}} \right), -\frac{1}{2} \right) - 110E \left(\sin^{-1} \left(\frac{2\sqrt{2-3x}}{\sqrt{11}} \right) \middle| -\frac{1}{2} \right) - 69\Pi \left(\frac{55}{124}; -\sin^{-1} \left(\frac{2\sqrt{2-3x}}{\sqrt{11}} \right) \middle| -\frac{1}{2} \right) \right)}{25\sqrt{22x-55}}$$

Antiderivative was successfully verified.

[In] Integrate[(Sqrt[2 - 3*x]*Sqrt[1 + 4*x])/(Sqrt[-5 + 2*x]*(7 + 5*x)),x]

[Out] (Sqrt[5 - 2*x]*(-110*EllipticE[ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2] + 41*EllipticF[ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2] - 69*EllipticPi[55/124, -ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2]))/(25*Sqrt[-55 + 22*x])

Maple [A] time = 0.013, size = 76, normalized size = 0.5

$$\frac{\sqrt{11}}{275} \left(41 \operatorname{EllipticF} \left(\frac{2}{11} \sqrt{22 - 33x}, i/2\sqrt{2} \right) - 110 \operatorname{EllipticE} \left(\frac{2}{11} \sqrt{22 - 33x}, i/2\sqrt{2} \right) + 69 \operatorname{EllipticPi} \left(\frac{2}{11} \sqrt{22 - 33x}, \frac{55}{124} \right) \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((2-3*x)^(1/2)*(4*x+1)^(1/2)/(7+5*x)/(2*x-5)^(1/2),x)

[Out] 1/275*(41*EllipticF(2/11*(22-33*x)^(1/2),1/2*I*2^(1/2))-110*EllipticE(2/11*(22-33*x)^(1/2),1/2*I*2^(1/2))+69*EllipticPi(2/11*(22-33*x)^(1/2),55/124,1/2*I*2^(1/2)))*(5-2*x)^(1/2)*11^(1/2)/(2*x-5)^(1/2)

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{4x+1}\sqrt{-3x+2}}{(5x+7)\sqrt{2x-5}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2-3*x)^(1/2)*(1+4*x)^(1/2)/(7+5*x)/(-5+2*x)^(1/2),x, algorithm="maxima")

[Out] integrate(sqrt(4*x + 1)*sqrt(-3*x + 2)/((5*x + 7)*sqrt(2*x - 5)), x)

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\operatorname{integral} \left(\frac{\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2}}{10x^2 - 11x - 35}, x \right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((2-3*x)^(1/2)*(1+4*x)^(1/2)/(7+5*x)/(-5+2*x)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)/(10*x^2 - 11*x - 35), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{2-3x}\sqrt{4x+1}}{\sqrt{2x-5}(5x+7)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((2-3*x)**(1/2)*(1+4*x)**(1/2)/(7+5*x)/(-5+2*x)**(1/2),x)
```

```
[Out] Integral(sqrt(2 - 3*x)*sqrt(4*x + 1)/(sqrt(2*x - 5)*(5*x + 7)), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{4x+1}\sqrt{-3x+2}}{(5x+7)\sqrt{2x-5}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((2-3*x)^(1/2)*(1+4*x)^(1/2)/(7+5*x)/(-5+2*x)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(sqrt(4*x + 1)*sqrt(-3*x + 2)/((5*x + 7)*sqrt(2*x - 5)), x)
```

$$3.49 \quad \int \frac{\sqrt{2-3x}\sqrt{1+4x}}{\sqrt{-5+2x}(7+5x)^2} dx$$

Optimal. Leaf size=189

$$\frac{2\sqrt{\frac{6}{11}}\sqrt{5-2x}\text{EllipticF}\left(\sin^{-1}\left(\sqrt{\frac{3}{11}}\sqrt{4x+1}\right), \frac{1}{3}\right)}{25\sqrt{2x-5}} + \frac{\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}}{39(5x+7)} - \frac{2\sqrt{11}\sqrt{2x-5}E\left(\sin^{-1}\left(\frac{2\sqrt{2-3x}}{\sqrt{11}}\right)\middle| -\frac{1}{2}\right)}{195\sqrt{5-2x}}$$

```
[Out] (Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/(39*(7 + 5*x)) - (2*Sqrt[11]*Sqrt[-5 + 2*x]*EllipticE[ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2])/(195*Sqrt[5 - 2*x]) - (2*Sqrt[6/11]*Sqrt[5 - 2*x]*EllipticF[ArcSin[Sqrt[3/11]*Sqrt[1 + 4*x]], 1/3])/(25*Sqrt[-5 + 2*x]) - (6101*Sqrt[5 - 2*x]*EllipticPi[55/124, ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2])/(20150*Sqrt[11]*Sqrt[-5 + 2*x])
```

Rubi [A] time = 0.214234, antiderivative size = 189, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 10, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}} = 0.286$, Rules used = {164, 1607, 168, 538, 537, 158, 114, 113, 121, 119}

$$\frac{\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}}{39(5x+7)} - \frac{2\sqrt{\frac{6}{11}}\sqrt{5-2x}F\left(\sin^{-1}\left(\sqrt{\frac{3}{11}}\sqrt{4x+1}\right)\middle| \frac{1}{3}\right)}{25\sqrt{2x-5}} - \frac{2\sqrt{11}\sqrt{2x-5}E\left(\sin^{-1}\left(\frac{2\sqrt{2-3x}}{\sqrt{11}}\right)\middle| -\frac{1}{2}\right)}{195\sqrt{5-2x}} - \frac{6101\sqrt{5-2x}}{20150\sqrt{11}}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[2 - 3*x]*Sqrt[1 + 4*x])/(Sqrt[-5 + 2*x]*(7 + 5*x)^2), x]
```

```
[Out] (Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/(39*(7 + 5*x)) - (2*Sqrt[11]*Sqrt[-5 + 2*x]*EllipticE[ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2])/(195*Sqrt[5 - 2*x]) - (2*Sqrt[6/11]*Sqrt[5 - 2*x]*EllipticF[ArcSin[Sqrt[3/11]*Sqrt[1 + 4*x]], 1/3])/(25*Sqrt[-5 + 2*x]) - (6101*Sqrt[5 - 2*x]*EllipticPi[55/124, ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2])/(20150*Sqrt[11]*Sqrt[-5 + 2*x])
```

Rule 164

```
Int[(((a_.) + (b_.)*(x_))^(m_)*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] := Simp[((a + b*x)^(m + 1)*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/((m + 1)*(b*c - a*d)), x] - Dist[1/(2*(m + 1)*(b*c - a*d)), Int[((a + b*x)^(m + 1)/(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]))*Simp[c*(f*g + e*h) + d*e*g*(2*m + 3) + 2*(c*f*h + d*(m + 2))
```

$(f*g + e*h)*x + d*f*h*(2*m + 5)*x^2, x], x] /;$ FreeQ[{a, b, c, d, e, f, g, h, m}, x] && IntegerQ[2*m] && LtQ[m, -1]

Rule 1607

Int[(Px_)*((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p_.)*((g_.) + (h_.)*(x_))^(q_.), x_Symbol] := Dist[PolynomialRemainder[Px, a + b*x, x], Int[(a + b*x)^m*(c + d*x)^n*(e + f*x)^p*(g + h*x)^q, x], x] + Int[PolynomialQuotient[Px, a + b*x, x]*(a + b*x)^(m + 1)*(c + d*x)^n*(e + f*x)^p*(g + h*x)^q, x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n, p, q}, x] && PolyQ[Px, x] && EqQ[m, -1]

Rule 168

Int[1/(((a_.) + (b_.)*(x_))*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Dist[-2, Subst[Int[1/(Simp[b*c - a*d - b*x^2, x]*Sqrt[Simp[(d*e - c*f)/d + (f*x^2)/d, x]]*Sqrt[Simp[(d*g - c*h)/d + (h*x^2)/d, x]]), x], x, Sqrt[c + d*x]], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x] && GtQ[(d*e - c*f)/d, 0]

Rule 538

Int[1/(((a_) + (b_.)*(x_)^2)*Sqrt[(c_) + (d_.)*(x_)^2]*Sqrt[(e_) + (f_.)*(x_)^2]), x_Symbol] := Dist[Sqrt[1 + (d*x^2)/c]/Sqrt[c + d*x^2], Int[1/((a + b*x^2)*Sqrt[1 + (d*x^2)/c]*Sqrt[e + f*x^2]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && !GtQ[c, 0]

Rule 537

Int[1/(((a_) + (b_.)*(x_)^2)*Sqrt[(c_) + (d_.)*(x_)^2]*Sqrt[(e_) + (f_.)*(x_)^2]), x_Symbol] := Simp[(1*EllipticPi[(b*c)/(a*d), ArcSin[Rt[-(d/c), 2]*x], (c*f)/(d*e)]/(a*Sqrt[c]*Sqrt[e]*Rt[-(d/c), 2]), x] /; FreeQ[{a, b, c, d, e, f}, x] && !GtQ[d/c, 0] && GtQ[c, 0] && GtQ[e, 0] && !(!GtQ[f/e, 0] && SimplerSqrtQ[-(f/e), -(d/c)])

Rule 158

Int[((g_.) + (h_.)*(x_))/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x_)]), x_Symbol] := Dist[h/f, Int[Sqrt[e + f*x]/(Sqrt[a + b*x]*Sqrt[c + d*x]), x], x] + Dist[(f*g - e*h)/f, Int[1/(Sqrt[a + b*x]*Sqrt[c + d*x]*Sqrt[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x] && SimplerQ[a + b*x, e + f*x] && SimplerQ[c + d*x, e + f*x]

Rule 114

```
Int[Sqrt[(e_.) + (f_.)*(x_)]/(Sqrt[(a_) + (b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]), x_Symbol] := Dist[(Sqrt[e + f*x]*Sqrt[(b*(c + d*x))/(b*c - a*d)])/(Sqrt[c + d*x]*Sqrt[(b*(e + f*x))/(b*e - a*f)])], Int[Sqrt[(b*e)/(b*e - a*f) + (b*f*x)/(b*e - a*f)]/(Sqrt[a + b*x]*Sqrt[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)])], x], x] /; FreeQ[{a, b, c, d, e, f}, x] && !(GtQ[b/(b*c - a*d), 0] && GtQ[b/(b*e - a*f), 0]) && !LtQ[-((b*c - a*d)/d), 0]
```

Rule 113

```
Int[Sqrt[(e_.) + (f_.)*(x_)]/(Sqrt[(a_) + (b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]), x_Symbol] := Simp[(2*Rt[-((b*e - a*f)/d), 2]*EllipticE[ArcSin[Sqrt[a + b*x]/Rt[-((b*c - a*d)/d), 2]], (f*(b*c - a*d))/(d*(b*e - a*f))]/b, x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[b/(b*c - a*d), 0] && GtQ[b/(b*e - a*f), 0] && !LtQ[-((b*c - a*d)/d), 0] && !(SimplerQ[c + d*x, a + b*x] && GtQ[-(d/(b*c - a*d)), 0] && GtQ[d/(d*e - c*f), 0] && !LtQ[(b*c - a*d)/b, 0])
```

Rule 121

```
Int[1/(Sqrt[(a_) + (b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x_)]), x_Symbol] := Dist[Sqrt[(b*(c + d*x))/(b*c - a*d)]/Sqrt[c + d*x], Int[1/(Sqrt[a + b*x]*Sqrt[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)]*Sqrt[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && !GtQ[(b*c - a*d)/b, 0] && SimplerQ[a + b*x, c + d*x] && SimplerQ[a + b*x, e + f*x]
```

Rule 119

```
Int[1/(Sqrt[(a_) + (b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x_)]), x_Symbol] := Simp[(2*Rt[-(b/d), 2]*EllipticF[ArcSin[Sqrt[a + b*x]/Rt[-(b/d), 2]*Sqrt[(b*c - a*d)/b]]], (f*(b*c - a*d))/(d*(b*e - a*f))]/(b*Sqrt[(b*e - a*f)/b]), x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[(b*c - a*d)/b, 0] && GtQ[(b*e - a*f)/b, 0] && PosQ[-(b/d)] && !(SimplerQ[c + d*x, a + b*x] && GtQ[(d*e - c*f)/d, 0] && GtQ[-(d/b), 0]) && !(SimplerQ[c + d*x, a + b*x] && GtQ[-(b*e) + a*f, f, 0] && GtQ[-(f/b), 0]) && !(SimplerQ[e + f*x, a + b*x] && GtQ[-(d*e) + c*f, f, 0] && GtQ[-(b*e) + a*f, f, 0] && (PosQ[-(f/d)] || PosQ[-(f/b)]))
```

Rubi steps

$$\begin{aligned}
\int \frac{\sqrt{2-3x}\sqrt{1+4x}}{\sqrt{-5+2x}(7+5x)^2} dx &= \frac{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{39(7+5x)} - \frac{1}{78} \int \frac{-29+120x-24x^2}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)} dx \\
&= \frac{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{39(7+5x)} - \frac{1}{78} \int \frac{\frac{768}{25} - \frac{24x}{5}}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}} dx + \frac{6101}{1950} \int \frac{1}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}} dx \\
&= \frac{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{39(7+5x)} + \frac{2}{65} \int \frac{\sqrt{-5+2x}}{\sqrt{2-3x}\sqrt{1+4x}} dx - \frac{6}{25} \int \frac{1}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}} dx \\
&= \frac{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{39(7+5x)} - \frac{\left(6\sqrt{\frac{2}{11}}\sqrt{5-2x}\right) \int \frac{1}{\sqrt{2-3x}\sqrt{\frac{10}{11}-\frac{4x}{11}}\sqrt{1+4x}} dx}{25\sqrt{-5+2x}} - \frac{(6101\sqrt{5-2x}) \operatorname{Su}}{195\sqrt{5-2x}} \\
&= \frac{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{39(7+5x)} - \frac{2\sqrt{11}\sqrt{-5+2x}E\left(\sin^{-1}\left(\frac{2\sqrt{2-3x}}{\sqrt{11}}\right)\middle|-\frac{1}{2}\right)}{195\sqrt{5-2x}} - \frac{2\sqrt{\frac{6}{11}}\sqrt{5-2x}F\left(\sin^{-1}\left(\frac{2\sqrt{2-3x}}{\sqrt{11}}\right)\middle|-\frac{1}{2}\right)}{25\sqrt{5-2x}}
\end{aligned}$$

Mathematica [A] time = 0.623383, size = 132, normalized size = 0.7

$$\frac{3\sqrt{55-22x}\left(14508\operatorname{EllipticF}\left(\sin^{-1}\left(\frac{2\sqrt{2-3x}}{\sqrt{11}}\right),-\frac{1}{2}\right)+6820E\left(\sin^{-1}\left(\frac{2\sqrt{2-3x}}{\sqrt{11}}\right)\middle|-\frac{1}{2}\right)+18303\Pi\left(\frac{55}{124};-\sin^{-1}\left(\frac{2\sqrt{2-3x}}{\sqrt{11}}\right)\middle|-\frac{1}{2}\right)\right)}{1994850\sqrt{2x-5}}$$

Antiderivative was successfully verified.

[In] Integrate[(Sqrt[2 - 3*x]*Sqrt[1 + 4*x])/(Sqrt[-5 + 2*x]*(7 + 5*x)^2),x]

[Out] ((51150*Sqrt[2 - 3*x]*(-5 + 2*x)*Sqrt[1 + 4*x])/(7 + 5*x) + 3*Sqrt[55 - 22*x]*(6820*EllipticE[ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2] + 14508*EllipticF[ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2] + 18303*EllipticPi[55/124, -ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2]))/(1994850*Sqrt[-5 + 2*x])

Maple [B] time = 0.016, size = 320, normalized size = 1.7

$$\frac{1}{(15958800x^3 - 46546500x^2 + 13963950x + 6649500)(7+5x)} \sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1} \left(72540\sqrt{11}\sqrt{2-3x}\sqrt{5-2x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `int((2-3*x)^(1/2)*(4*x+1)^(1/2)/(7+5*x)^2/(2*x-5)^(1/2),x)`

[Out]
$$\begin{aligned} & -1/664950*(2-3*x)^{(1/2)}*(4*x+1)^{(1/2)}*(2*x-5)^{(1/2)}*(72540*11^{(1/2)}*(2-3*x)^{(1/2)} \\ & *(5-2*x)^{(1/2)}*(4*x+1)^{(1/2)}*\text{EllipticF}(2/11*(22-33*x)^{(1/2)},1/2*I*2^{(1/2)}) \\ & *x+34100*11^{(1/2)}*(2-3*x)^{(1/2)}*(5-2*x)^{(1/2)}*(4*x+1)^{(1/2)}*\text{EllipticE}(\\ & 2/11*(22-33*x)^{(1/2)},1/2*I*2^{(1/2)})*x-91515*11^{(1/2)}*(2-3*x)^{(1/2)}*(5-2*x)^{(1/2)} \\ & *(4*x+1)^{(1/2)}*\text{EllipticPi}(2/11*(22-33*x)^{(1/2)},55/124,1/2*I*2^{(1/2)})*x \\ & +101556*11^{(1/2)}*(2-3*x)^{(1/2)}*(5-2*x)^{(1/2)}*(4*x+1)^{(1/2)}*\text{EllipticF}(2/11*(\\ & 22-33*x)^{(1/2)},1/2*I*2^{(1/2)})+47740*11^{(1/2)}*(2-3*x)^{(1/2)}*(5-2*x)^{(1/2)}*(4 \\ & *x+1)^{(1/2)}*\text{EllipticE}(2/11*(22-33*x)^{(1/2)},1/2*I*2^{(1/2)})-128121*11^{(1/2)}*(\\ & 2-3*x)^{(1/2)}*(5-2*x)^{(1/2)}*(4*x+1)^{(1/2)}*\text{EllipticPi}(2/11*(22-33*x)^{(1/2)},55 \\ & /124,1/2*I*2^{(1/2)})-409200*x^3+1193500*x^2-358050*x-170500)/(24*x^3-70*x^2+ \\ & 21*x+10)/(7+5*x) \end{aligned}$$

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{4x+1}\sqrt{-3x+2}}{(5x+7)^2\sqrt{2x-5}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((2-3*x)^(1/2)*(1+4*x)^(1/2)/(7+5*x)^2/(-5+2*x)^(1/2),x, algorithm="maxima")`

[Out] `integrate(sqrt(4*x + 1)*sqrt(-3*x + 2)/((5*x + 7)^2*sqrt(2*x - 5)), x)`

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2}}{50x^3+15x^2-252x-245},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((2-3*x)^(1/2)*(1+4*x)^(1/2)/(7+5*x)^2/(-5+2*x)^(1/2),x, algorithm="fricas")`

[Out] `integral(sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)/(50*x^3 + 15*x^2 - 252*x - 245), x)`

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{2-3x}\sqrt{4x+1}}{\sqrt{2x-5}(5x+7)^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2-3*x)**(1/2)*(1+4*x)**(1/2)/(7+5*x)**2/(-5+2*x)**(1/2), x)

[Out] Integral(sqrt(2 - 3*x)*sqrt(4*x + 1)/(sqrt(2*x - 5)*(5*x + 7)**2), x)

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{4x+1}\sqrt{-3x+2}}{(5x+7)^2\sqrt{2x-5}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2-3*x)^(1/2)*(1+4*x)^(1/2)/(7+5*x)^2/(-5+2*x)^(1/2), x, algorithm="giac")

[Out] integrate(sqrt(4*x + 1)*sqrt(-3*x + 2)/((5*x + 7)^2*sqrt(2*x - 5)), x)

$$3.50 \quad \int \frac{\sqrt{2-3x}\sqrt{1+4x}}{\sqrt{-5+2x}(7+5x)^3} dx$$

Optimal. Leaf size=225

$$\frac{6101\sqrt{5-2x}\text{EllipticF}\left(\sin^{-1}\left(\sqrt{\frac{3}{11}}\sqrt{4x+1}\right), \frac{1}{3}\right)}{231725\sqrt{66}\sqrt{2x-5}} - \frac{361\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}}{481988(5x+7)} + \frac{\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}}{78(5x+7)^2} + \frac{361\sqrt{11}}{1204970}$$

[Out] (Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/(78*(7 + 5*x)^2) - (361*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/(481988*(7 + 5*x)) + (361*Sqrt[11]*Sqrt[-5 + 2*x]*EllipticE[ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2])/(1204970*Sqrt[5 - 2*x]) - (6101*Sqrt[5 - 2*x]*EllipticF[ArcSin[Sqrt[3/11]*Sqrt[1 + 4*x]], 1/3])/(231725*Sqrt[66]*Sqrt[-5 + 2*x]) - (6655867*Sqrt[5 - 2*x]*EllipticPi[55/124, ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2])/(747081400*Sqrt[11]*Sqrt[-5 + 2*x])

Rubi [A] time = 0.300811, antiderivative size = 225, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 11, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}} = 0.314$, Rules used = {164, 1604, 1607, 168, 538, 537, 158, 114, 113, 121, 119}

$$-\frac{361\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}}{481988(5x+7)} + \frac{\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}}{78(5x+7)^2} - \frac{6101\sqrt{5-2x}F\left(\sin^{-1}\left(\sqrt{\frac{3}{11}}\sqrt{4x+1}\right)\middle|\frac{1}{3}\right)}{231725\sqrt{66}\sqrt{2x-5}} + \frac{361\sqrt{11}\sqrt{2x-5}}{1204970}$$

Antiderivative was successfully verified.

[In] Int[(Sqrt[2 - 3*x]*Sqrt[1 + 4*x])/(Sqrt[-5 + 2*x]*(7 + 5*x)^3), x]

[Out] (Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/(78*(7 + 5*x)^2) - (361*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/(481988*(7 + 5*x)) + (361*Sqrt[11]*Sqrt[-5 + 2*x]*EllipticE[ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2])/(1204970*Sqrt[5 - 2*x]) - (6101*Sqrt[5 - 2*x]*EllipticF[ArcSin[Sqrt[3/11]*Sqrt[1 + 4*x]], 1/3])/(231725*Sqrt[66]*Sqrt[-5 + 2*x]) - (6655867*Sqrt[5 - 2*x]*EllipticPi[55/124, ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2])/(747081400*Sqrt[11]*Sqrt[-5 + 2*x])

Rule 164

Int[(((a_.) + (b_.)*(x_))^(m_)*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)])/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] := Simp[((a + b*x)^(m + 1)*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/((m + 1)*(b*c - a*d)), x] - Dist[1/(2


```

*(m + 1)*(b*c - a*d), Int[((a + b*x)^(m + 1)/(Sqrt[c + d*x]*Sqrt[e + f*x]*
Sqrt[g + h*x]))*Simp[c*(f*g + e*h) + d*e*g*(2*m + 3) + 2*(c*f*h + d*(m + 2)
*(f*g + e*h))*x + d*f*h*(2*m + 5)*x^2, x], x] /; FreeQ[{a, b, c, d, e,
f, g, h, m}, x] && IntegerQ[2*m] && LtQ[m, -1]

```

Rule 1604

```

Int[(((a_.) + (b_.)*(x_))^(m_.)*((A_.) + (B_.)*(x_) + (C_.)*(x_)^2))/(Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Simp[((A*b^2 - a*b*B + a^2*C)*(a + b*x)^(m + 1)*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/((m + 1)*(b*c - a*d)*(b*e - a*f)*(b*g - a*h)), x] - Dist[1/(2*(m + 1)*(b*c - a*d)*(b*e - a*f)*(b*g - a*h)), Int[((a + b*x)^(m + 1)/(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]))*Simp[A*(2*a^2*d*f*h*(m + 1) - 2*a*b*(m + 1)*(d*f*g + d*e*h + c*f*h) + b^2*(2*m + 3)*(d*e*g + c*f*g + c*e*h)) - (b*B - a*C)*(a*(d*e*g + c*f*g + c*e*h) + 2*b*c*e*g*(m + 1)) - 2*((A*b - a*B)*(a*d*f*h*(m + 1) - b*(m + 2)*(d*f*g + d*e*h + c*f*h)) - C*(a^2*(d*f*g + d*e*h + c*f*h) - b^2*c*e*g*(m + 1) + a*b*(m + 1)*(d*e*g + c*f*g + c*e*h)))*x + d*f*h*(2*m + 5)*(A*b^2 - a*b*B + a^2*C)*x^2, x], x] /; FreeQ[{a, b, c, d, e, f, g, h, A, B, C}, x] && IntegerQ[2*m] && LtQ[m, -1]

```

Rule 1607

```

Int[(Px_)*((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p_.)*((g_.) + (h_.)*(x_))^(q_.), x_Symbol] := Dist[PolynomialRemainder[Px, a + b*x, x], Int[(a + b*x)^m*(c + d*x)^n*(e + f*x)^p*(g + h*x)^q, x], x] + Int[PolynomialQuotient[Px, a + b*x, x]*(a + b*x)^(m + 1)*(c + d*x)^n*(e + f*x)^p*(g + h*x)^q, x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n, p, q}, x] && PolyQ[Px, x] && EqQ[m, -1]

```

Rule 168

```

Int[1/(((a_.) + (b_.)*(x_))*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Dist[-2, Subst[Int[1/(Simp[b*c - a*d - b*x^2, x]*Sqrt[Simp[(d*e - c*f)/d + (f*x^2)/d, x]]*Sqrt[Simp[(d*g - c*h)/d + (h*x^2)/d, x]]), x], x, Sqrt[c + d*x]], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x] && GtQ[(d*e - c*f)/d, 0]

```

Rule 538

```

Int[1/(((a_.) + (b_.)*(x_)^2)*Sqrt[(c_.) + (d_.)*(x_)^2]*Sqrt[(e_.) + (f_.)*(x_)^2]), x_Symbol] := Dist[Sqrt[1 + (d*x^2)/c]/Sqrt[c + d*x^2], Int[1/((a + b*x^2)*Sqrt[1 + (d*x^2)/c]*Sqrt[e + f*x^2]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && !GtQ[c, 0]

```

Rule 537

```
Int[1/(((a_) + (b_)*(x_)^2)*Sqrt[(c_) + (d_)*(x_)^2]*Sqrt[(e_) + (f_)*(x_)^2]), x_Symbol] :> Simp[(1*EllipticPi[(b*c)/(a*d), ArcSin[Rt[-(d/c), 2]*x], (c*f)/(d*e))]/(a*Sqrt[c]*Sqrt[e]*Rt[-(d/c), 2]), x] /; FreeQ[{a, b, c, d, e, f}, x] && !GtQ[d/c, 0] && GtQ[c, 0] && GtQ[e, 0] && !(GtQ[f/e, 0] && SimplrSqrtQ[-(f/e), -(d/c)])
```

Rule 158

```
Int[((g_) + (h_)*(x_))/(Sqrt[(a_) + (b_)*(x_)]*Sqrt[(c_) + (d_)*(x_)]*Sqrt[(e_) + (f_)*(x_)]), x_Symbol] :> Dist[h/f, Int[Sqrt[e + f*x]/(Sqrt[a + b*x]*Sqrt[c + d*x]), x], x] + Dist[(f*g - e*h)/f, Int[1/(Sqrt[a + b*x]*Sqrt[c + d*x]*Sqrt[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x] && SimplrQ[a + b*x, e + f*x] && SimplrQ[c + d*x, e + f*x]
```

Rule 114

```
Int[Sqrt[(e_) + (f_)*(x_)]/(Sqrt[(a_) + (b_)*(x_)]*Sqrt[(c_) + (d_)*(x_)]), x_Symbol] :> Dist[(Sqrt[e + f*x]*Sqrt[(b*(c + d*x))/(b*c - a*d)])/(Sqrt[c + d*x]*Sqrt[(b*(e + f*x))/(b*e - a*f)]), Int[Sqrt[(b*e)/(b*e - a*f) + (b*f*x)/(b*e - a*f)]/(Sqrt[a + b*x]*Sqrt[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && !(GtQ[b/(b*c - a*d), 0] && GtQ[b/(b*e - a*f), 0]) && !LtQ[-((b*c - a*d)/d), 0]
```

Rule 113

```
Int[Sqrt[(e_) + (f_)*(x_)]/(Sqrt[(a_) + (b_)*(x_)]*Sqrt[(c_) + (d_)*(x_)]), x_Symbol] :> Simp[(2*Rt[-((b*e - a*f)/d), 2]*EllipticE[ArcSin[Sqrt[a + b*x]/Rt[-((b*c - a*d)/d), 2]], (f*(b*c - a*d))/(d*(b*e - a*f))]/b, x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[b/(b*c - a*d), 0] && GtQ[b/(b*e - a*f), 0] && !LtQ[-((b*c - a*d)/d), 0] && !(SimplerQ[c + d*x, a + b*x] && GtQ[-(d/(b*c - a*d)), 0] && GtQ[d/(d*e - c*f), 0] && !LtQ[(b*c - a*d)/b, 0])
```

Rule 121

```
Int[1/(Sqrt[(a_) + (b_)*(x_)]*Sqrt[(c_) + (d_)*(x_)]*Sqrt[(e_) + (f_)*(x_)]), x_Symbol] :> Dist[Sqrt[(b*(c + d*x))/(b*c - a*d)]/Sqrt[c + d*x], Int[1/(Sqrt[a + b*x]*Sqrt[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)]*Sqrt[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && !GtQ[(b*c - a*d)/b, 0] && SimplrQ[a + b*x, c + d*x] && SimplrQ[a + b*x, e + f*x]
```

Rule 119

```
Int[1/(Sqrt[(a_) + (b_)*(x_)]*Sqrt[(c_) + (d_)*(x_)]*Sqrt[(e_) + (f_)*(x_)]), x_Symbol] :> Dist[Sqrt[(b*(c + d*x))/(b*c - a*d)]/Sqrt[c + d*x], Int[1/(Sqrt[a + b*x]*Sqrt[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)]*Sqrt[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && !GtQ[(b*c - a*d)/b, 0] && SimplrQ[a + b*x, c + d*x] && SimplrQ[a + b*x, e + f*x]
```

```

_)]), x_Symbol] := Simp[(2*Rt[-(b/d), 2]*EllipticF[ArcSin[Sqrt[a + b*x]/(Rt
[-(b/d), 2]*Sqrt[(b*c - a*d)/b]])], (f*(b*c - a*d))/(d*(b*e - a*f)))/(b*Sqr
t[(b*e - a*f)/b]), x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[(b*c - a*d)/b,
0] && GtQ[(b*e - a*f)/b, 0] && PosQ[-(b/d)] && !(SimplerQ[c + d*x, a + b*
x] && GtQ[(d*e - c*f)/d, 0] && GtQ[-(d/b), 0]) && !(SimplerQ[c + d*x, a +
b*x] && GtQ[(-(b*e) + a*f)/f, 0] && GtQ[-(f/b), 0]) && !(SimplerQ[e + f*x,
a + b*x] && GtQ[(-(d*e) + c*f)/f, 0] && GtQ[(-(b*e) + a*f)/f, 0] && (PosQ[
-(f/d)] || PosQ[-(f/b)]))

```

Rubi steps

$$\begin{aligned}
\int \frac{\sqrt{2-3x}\sqrt{1+4x}}{\sqrt{-5+2x}(7+5x)^3} dx &= \frac{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{78(7+5x)^2} - \frac{1}{156} \int \frac{-37+100x+24x^2}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^2} dx \\
&= \frac{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{78(7+5x)^2} - \frac{361\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{481988(7+5x)} - \frac{\int \frac{-272145+485280x+77976x^2}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)} dx}{8675784} \\
&= \frac{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{78(7+5x)^2} - \frac{361\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{481988(7+5x)} - \frac{\int \frac{\frac{1880568}{25} + \frac{77976x}{5}}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}} dx}{8675784} + \frac{6101\sqrt{5-2x}}{1204970} \\
&= \frac{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{78(7+5x)^2} - \frac{361\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{481988(7+5x)} - \frac{1083 \int \frac{\sqrt{-5+2x}}{\sqrt{2-3x}\sqrt{1+4x}} dx}{1204970} - \frac{6101\sqrt{5-2x}}{1204970} \\
&= \frac{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{78(7+5x)^2} - \frac{361\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{481988(7+5x)} - \frac{(6101\sqrt{5-2x}) \int \frac{1}{\sqrt{2-3x}\sqrt{\frac{10}{11}-x}}} dx}{231725\sqrt{22}\sqrt{-5+2x}} \\
&= \frac{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{78(7+5x)^2} - \frac{361\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{481988(7+5x)} + \frac{361\sqrt{11}\sqrt{-5+2x}E\left(\sin^{-1}\left(\frac{2\sqrt{2-3x}}{\sqrt{11}}\right), -\frac{1}{2}\right)}{1204970\sqrt{5-2x}}
\end{aligned}$$

Mathematica [A] time = 0.56169, size = 137, normalized size = 0.61

$$\frac{-3\sqrt{55-22x}\left(-9834812\text{EllipticF}\left(\sin^{-1}\left(\frac{2\sqrt{2-3x}}{\sqrt{11}}\right), -\frac{1}{2}\right) + 2462020E\left(\sin^{-1}\left(\frac{2\sqrt{2-3x}}{\sqrt{11}}\right) \middle| -\frac{1}{2}\right) - 6655867\Pi\left(\frac{55}{124}; -\sin^{-1}\left(\frac{2\sqrt{2-3x}}{\sqrt{11}}\right)\right)\right)}{24653686200\sqrt{2x-5}}$$

Antiderivative was successfully verified.

[In] Integrate[(Sqrt[2 - 3*x]*Sqrt[1 + 4*x])/(Sqrt[-5 + 2*x]*(7 + 5*x)^3), x]

```
[Out] ((-17050*Sqrt[2 - 3*x]*(-5 + 2*x)*Sqrt[1 + 4*x]*(-10957 + 5415*x))/(7 + 5*x)
^2 - 3*Sqrt[55 - 22*x]*(2462020*EllipticE[ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]
]], -1/2] - 9834812*EllipticF[ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2] - 6
655867*EllipticPi[55/124, -ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2]))/(246
53686200*Sqrt[-5 + 2*x])
```

Maple [B] time = 0.016, size = 461, normalized size = 2.1

$$\frac{1}{(591688468800x^3 - 1725758034000x^2 + 517727410200x + 246536862000)(7 + 5x)^2} \sqrt{2 - 3x} \sqrt{2x - 5} \sqrt{4x + 1} \left(737 \right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((2-3*x)^(1/2)*(4*x+1)^(1/2)/(7+5*x)^3/(2*x-5)^(1/2), x)
```

```
[Out] -1/24653686200*(2-3*x)^(1/2)*(4*x+1)^(1/2)*(2*x-5)^(1/2)*(737610900*11^(1/2)
)*(2-3*x)^(1/2)*(5-2*x)^(1/2)*(4*x+1)^(1/2)*EllipticF(2/11*(22-33*x)^(1/2),
1/2*I*2^(1/2))*x^2-184651500*11^(1/2)*(2-3*x)^(1/2)*(5-2*x)^(1/2)*(4*x+1)^(
1/2)*EllipticE(2/11*(22-33*x)^(1/2),1/2*I*2^(1/2))*x^2-499190025*11^(1/2)*(
2-3*x)^(1/2)*(5-2*x)^(1/2)*(4*x+1)^(1/2)*EllipticPi(2/11*(22-33*x)^(1/2),55
/124,1/2*I*2^(1/2))*x^2+2065310520*11^(1/2)*(2-3*x)^(1/2)*(5-2*x)^(1/2)*(4*
x+1)^(1/2)*EllipticF(2/11*(22-33*x)^(1/2),1/2*I*2^(1/2))*x-517024200*11^(1/
2)*(2-3*x)^(1/2)*(5-2*x)^(1/2)*(4*x+1)^(1/2)*EllipticE(2/11*(22-33*x)^(1/2)
,1/2*I*2^(1/2))*x-1397732070*11^(1/2)*(2-3*x)^(1/2)*(5-2*x)^(1/2)*(4*x+1)^(
1/2)*EllipticPi(2/11*(22-33*x)^(1/2),55/124,1/2*I*2^(1/2))*x+1445717364*11^(
1/2)*(2-3*x)^(1/2)*(5-2*x)^(1/2)*(4*x+1)^(1/2)*EllipticF(2/11*(22-33*x)^(1
/2),1/2*I*2^(1/2))-361916940*11^(1/2)*(2-3*x)^(1/2)*(5-2*x)^(1/2)*(4*x+1)^(
1/2)*EllipticE(2/11*(22-33*x)^(1/2),1/2*I*2^(1/2))-978412449*11^(1/2)*(2-3*
x)^(1/2)*(5-2*x)^(1/2)*(4*x+1)^(1/2)*EllipticPi(2/11*(22-33*x)^(1/2),55/124
,1/2*I*2^(1/2))+2215818000*x^4-10946406900*x^3+15016020250*x^2-2999896350*x
-1868168500)/(24*x^3-70*x^2+21*x+10)/(7+5*x)^2
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{4x+1}\sqrt{-3x+2}}{(5x+7)^3\sqrt{2x-5}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2-3*x)^(1/2)*(1+4*x)^(1/2)/(7+5*x)^3/(-5+2*x)^(1/2),x, algorithm="maxima")

[Out] integrate(sqrt(4*x + 1)*sqrt(-3*x + 2)/((5*x + 7)^3*sqrt(2*x - 5)), x)

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2}}{250x^4+425x^3-1155x^2-2989x-1715}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2-3*x)^(1/2)*(1+4*x)^(1/2)/(7+5*x)^3/(-5+2*x)^(1/2),x, algorithm="fricas")

[Out] integral(sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)/(250*x^4 + 425*x^3 - 1155*x^2 - 2989*x - 1715), x)

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2-3*x)**(1/2)*(1+4*x)**(1/2)/(7+5*x)**3/(-5+2*x)**(1/2),x)

[Out] Timed out

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{4x+1}\sqrt{-3x+2}}{(5x+7)^3\sqrt{2x-5}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2-3*x)^(1/2)*(1+4*x)^(1/2)/(7+5*x)^3/(-5+2*x)^(1/2),x, algorithm="giac")

```
[Out] integrate(sqrt(4*x + 1)*sqrt(-3*x + 2)/((5*x + 7)^3*sqrt(2*x - 5)), x)
```

$$3.51 \quad \int \frac{\sqrt{2-3x}(7+5x)^3}{\sqrt{-5+2x}\sqrt{1+4x}} dx$$

Optimal. Leaf size=205

$$\frac{25260049\sqrt{\frac{11}{6}}\sqrt{5-2x}\text{EllipticF}\left(\sin^{-1}\left(\sqrt{\frac{3}{11}}\sqrt{4x+1}\right), \frac{1}{3}\right)}{6048\sqrt{2x-5}} + \frac{5}{28}\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}(5x+7)^2 + \frac{121}{24}\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}$$

```
[Out] (110743*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/864 + (121*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(7 + 5*x))/24 + (5*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(7 + 5*x)^2)/28 + (15629623*Sqrt[11]*Sqrt[-5 + 2*x]*EllipticE[ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2])/(9072*Sqrt[5 - 2*x]) - (25260049*Sqrt[11/6]*Sqrt[5 - 2*x]*EllipticF[ArcSin[Sqrt[3/11]*Sqrt[1 + 4*x]], 1/3])/(6048*Sqrt[-5 + 2*x])
```

Rubi [A] time = 0.212381, antiderivative size = 205, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 8, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}} = 0.229$, Rules used = {174, 1600, 1615, 158, 114, 113, 121, 119}

$$\frac{5}{28}\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}(5x+7)^2 + \frac{121}{24}\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}(5x+7) + \frac{110743}{864}\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1} - \frac{25260049\sqrt{11/6}\sqrt{5-2x}\text{EllipticF}\left(\sin^{-1}\left(\sqrt{\frac{3}{11}}\sqrt{4x+1}\right), \frac{1}{3}\right)}{6048\sqrt{2x-5}}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[2 - 3*x]*(7 + 5*x)^3)/(Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]), x]
```

```
[Out] (110743*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/864 + (121*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(7 + 5*x))/24 + (5*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(7 + 5*x)^2)/28 + (15629623*Sqrt[11]*Sqrt[-5 + 2*x]*EllipticE[ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2])/(9072*Sqrt[5 - 2*x]) - (25260049*Sqrt[11/6]*Sqrt[5 - 2*x]*EllipticF[ArcSin[Sqrt[3/11]*Sqrt[1 + 4*x]], 1/3])/(6048*Sqrt[-5 + 2*x])
```

Rule 174

```
Int[(((a_.) + (b_.)*(x_))^(m_)*Sqrt[(c_.) + (d_.)*(x_)])/(Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] :> Simp[(2*b*(a + b*x)^(m - 1)*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(f*h*(2*m + 1)), x] - Dist[1/(f*h*(2*m + 1)), Int[((a + b*x)^(m - 2)/(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]))*Simp[a*b*(d*e*g + c*(f*g + e*h)) + 2*b^2*c*e*g*(m - 1) - a^2*c*f*h*
```

```
(2*m + 1) + (b^2*(2*m - 1)*(d*e*g + c*(f*g + e*h)) - a^2*d*f*h*(2*m + 1) +
2*a*b*(d*f*g + d*e*h - 2*c*f*h*m))*x - b*(a*d*f*h*(4*m - 1) + b*(c*f*h - 2*
d*(f*g + e*h)*m))*x^2, x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m}, x]
&& IntegerQ[2*m] && GtQ[m, 1]
```

Rule 1600

```
Int[(((a_.) + (b_.)*(x_))^(m_.)*((A_.) + (B_.)*(x_) + (C_.)*(x_)^2))/(Sqrt[
(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_S
ymbol] :> Simp[(2*C*(a + b*x)^m*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/
(d*f*h*(2*m + 3)), x] + Dist[1/(d*f*h*(2*m + 3)), Int[((a + b*x)^(m - 1)/(S
qrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]))*Simp[a*A*d*f*h*(2*m + 3) - C*(a*
(d*e*g + c*f*g + c*e*h) + 2*b*c*e*g*m) + ((A*b + a*B)*d*f*h*(2*m + 3) - C*(
2*a*(d*f*g + d*e*h + c*f*h) + b*(2*m + 1)*(d*e*g + c*f*g + c*e*h)))*x + (b*
B*d*f*h*(2*m + 3) + 2*C*(a*d*f*h*m - b*(m + 1)*(d*f*g + d*e*h + c*f*h)))*x^
2, x], x], x] /; FreeQ[{a, b, c, d, e, f, g, h, A, B, C}, x] && IntegerQ[2*
m] && GtQ[m, 0]
```

Rule 1615

```
Int[(Px_)*((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f
_.)*(x_))^(p_.), x_Symbol] :> With[{q = Expon[Px, x], k = Coeff[Px, x, Expo
n[Px, x]]}, Simp[(k*(a + b*x)^(m + q - 1)*(c + d*x)^(n + 1)*(e + f*x)^(p +
1))/(d*f*b^(q - 1)*(m + n + p + q + 1)), x] + Dist[1/(d*f*b^q*(m + n + p +
q + 1)), Int[(a + b*x)^m*(c + d*x)^n*(e + f*x)^p*ExpandToSum[d*f*b^q*(m + n
+ p + q + 1)*Px - d*f*k*(m + n + p + q + 1)*(a + b*x)^q + k*(a + b*x)^(q -
2)*(a^2*d*f*(m + n + p + q + 1) - b*(b*c*e*(m + q - 1) + a*(d*e*(n + 1) +
c*f*(p + 1))) + b*(a*d*f*(2*(m + q) + n + p) - b*(d*e*(m + q + n) + c*f*(m
+ q + p)))*x], x], x] /; NeQ[m + n + p + q + 1, 0] /; FreeQ[{a, b, c,
d, e, f, m, n, p}, x] && PolyQ[Px, x] && IntegersQ[2*m, 2*n, 2*p]
```

Rule 158

```
Int[((g_.) + (h_.)*(x_))/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]*
Sqrt[(e_.) + (f_.)*(x_)]), x_Symbol] :> Dist[h/f, Int[Sqrt[e + f*x]/(Sqrt[a
+ b*x]*Sqrt[c + d*x]), x], x] + Dist[(f*g - e*h)/f, Int[1/(Sqrt[a + b*x]*Sq
rt[c + d*x]*Sqrt[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x] &&
SimplerQ[a + b*x, e + f*x] && SimplerQ[c + d*x, e + f*x]
```

Rule 114

```
Int[Sqrt[(e_.) + (f_.)*(x_)]/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_
)]), x_Symbol] :> Dist[(Sqrt[e + f*x]*Sqrt[(b*(c + d*x))/(b*c - a*d)])/(Sqr
t[c + d*x]*Sqrt[(b*(e + f*x))/(b*e - a*f)]), Int[Sqrt[(b*e)/(b*e - a*f) + (
b*f*x)/(b*e - a*f)]/(Sqrt[a + b*x]*Sqrt[(b*c)/(b*c - a*d) + (b*d*x)/(b*c -
```



```
a*d)]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && !(GtQ[b/(b*c - a*d), 0]
&& GtQ[b/(b*e - a*f), 0]) && !LtQ[-((b*c - a*d)/d), 0]
```

Rule 113

```
Int[Sqrt[(e_.) + (f_.)*(x_)]/(Sqrt[(a_) + (b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_
)]), x_Symbol] := Simp[(2*Rt[-((b*e - a*f)/d), 2]*EllipticE[ArcSin[Sqrt[a +
b*x]/Rt[-((b*c - a*d)/d), 2]], (f*(b*c - a*d))/(d*(b*e - a*f))]/b, x] /;
FreeQ[{a, b, c, d, e, f}, x] && GtQ[b/(b*c - a*d), 0] && GtQ[b/(b*e - a*f),
0] && !LtQ[-((b*c - a*d)/d), 0] && !(SimplerQ[c + d*x, a + b*x] && GtQ[-
(d/(b*c - a*d)), 0] && GtQ[d/(d*e - c*f), 0] && !LtQ[(b*c - a*d)/b, 0])
```

Rule 121

```
Int[1/(Sqrt[(a_) + (b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x
_)]), x_Symbol] := Dist[Sqrt[(b*(c + d*x))/(b*c - a*d)]/Sqrt[c + d*x], Int[
1/(Sqrt[a + b*x]*Sqrt[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)]*Sqrt[e + f*x
]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && !GtQ[(b*c - a*d)/b, 0] && Si
mplerQ[a + b*x, c + d*x] && SimplerQ[a + b*x, e + f*x]
```

Rule 119

```
Int[1/(Sqrt[(a_) + (b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x
_)]), x_Symbol] := Simp[(2*Rt[-(b/d), 2]*EllipticF[ArcSin[Sqrt[a + b*x]/(Rt
[-(b/d), 2]*Sqrt[(b*c - a*d)/b])], (f*(b*c - a*d))/(d*(b*e - a*f))]/(b*Sqr
t[(b*e - a*f)/b]), x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[(b*c - a*d)/b,
0] && GtQ[(b*e - a*f)/b, 0] && PosQ[-(b/d)] && !(SimplerQ[c + d*x, a + b*
x] && GtQ[(d*e - c*f)/d, 0] && GtQ[-(d/b), 0]) && !(SimplerQ[c + d*x, a +
b*x] && GtQ[(-(b*e) + a*f)/f, 0] && GtQ[-(f/b), 0]) && !(SimplerQ[e + f*x,
a + b*x] && GtQ[(-(d*e) + c*f)/f, 0] && GtQ[(-(b*e) + a*f)/f, 0] && (PosQ[
-(f/d)] || PosQ[-(f/b)]))
```

Rubi steps

$$\begin{aligned}
\int \frac{\sqrt{2-3x}(7+5x)^3}{\sqrt{-5+2x}\sqrt{1+4x}} dx &= \frac{5}{28} \sqrt{2-3x} \sqrt{-5+2x} \sqrt{1+4x} (7+5x)^2 - \frac{1}{56} \int \frac{(7+5x)(-7223+2667x+16940x^2)}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}} dx \\
&= \frac{121}{24} \sqrt{2-3x} \sqrt{-5+2x} \sqrt{1+4x} (7+5x) + \frac{5}{28} \sqrt{2-3x} \sqrt{-5+2x} \sqrt{1+4x} (7+5x)^2 + \frac{\int \frac{10251500-}{\sqrt{2-}}}{\sqrt{2-}} \\
&= \frac{110743}{864} \sqrt{2-3x} \sqrt{-5+2x} \sqrt{1+4x} + \frac{121}{24} \sqrt{2-3x} \sqrt{-5+2x} \sqrt{1+4x} (7+5x) + \frac{5}{28} \sqrt{2-3x} \sqrt{-5+2x} \sqrt{1+4x} (7+5x)^2 \\
&= \frac{110743}{864} \sqrt{2-3x} \sqrt{-5+2x} \sqrt{1+4x} + \frac{121}{24} \sqrt{2-3x} \sqrt{-5+2x} \sqrt{1+4x} (7+5x) + \frac{5}{28} \sqrt{2-3x} \sqrt{-5+2x} \sqrt{1+4x} (7+5x)^2 \\
&= \frac{110743}{864} \sqrt{2-3x} \sqrt{-5+2x} \sqrt{1+4x} + \frac{121}{24} \sqrt{2-3x} \sqrt{-5+2x} \sqrt{1+4x} (7+5x) + \frac{5}{28} \sqrt{2-3x} \sqrt{-5+2x} \sqrt{1+4x} (7+5x)^2 \\
&= \frac{110743}{864} \sqrt{2-3x} \sqrt{-5+2x} \sqrt{1+4x} + \frac{121}{24} \sqrt{2-3x} \sqrt{-5+2x} \sqrt{1+4x} (7+5x) + \frac{5}{28} \sqrt{2-3x} \sqrt{-5+2x} \sqrt{1+4x} (7+5x)^2
\end{aligned}$$

Mathematica [A] time = 0.349892, size = 125, normalized size = 0.61

$$\frac{-25260049\sqrt{66}\sqrt{5-2x}\text{EllipticF}\left(\sin^{-1}\left(\sqrt{\frac{3}{11}}\sqrt{4x+1}\right), \frac{1}{3}\right) + 30\sqrt{2-3x}\sqrt{4x+1}\left(10800x^3 + 64224x^2 + 188566x - 1041565\right)}{36288\sqrt{2x-5}}$$

Antiderivative was successfully verified.

[In] Integrate[(Sqrt[2 - 3*x]*(7 + 5*x)^3)/(Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]), x]

[Out] (30*Sqrt[2 - 3*x]*Sqrt[1 + 4*x]*(-1041565 + 188566*x + 64224*x^2 + 10800*x^3) + 31259246*Sqrt[66]*Sqrt[5 - 2*x]*EllipticE[ArcSin[Sqrt[3/11]*Sqrt[1 + 4*x]]], 1/3] - 25260049*Sqrt[66]*Sqrt[5 - 2*x]*EllipticF[ArcSin[Sqrt[3/11]*Sqrt[1 + 4*x]], 1/3])/(36288*Sqrt[-5 + 2*x])

Maple [A] time = 0.023, size = 150, normalized size = 0.7

$$\frac{1}{870912x^3 - 2540160x^2 + 762048x + 362880} \sqrt{2-3x} \sqrt{2x-5} \sqrt{4x+1} \left(75780147 \sqrt{11} \sqrt{2-3x} \sqrt{5-2x} \sqrt{4x+1} \text{EllipticE}\left(\sin^{-1}\left(\sqrt{\frac{3}{11}}\sqrt{4x+1}\right), \frac{1}{3}\right) + 30\sqrt{2-3x}\sqrt{4x+1}\left(10800x^3 + 64224x^2 + 188566x - 1041565\right) \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `int((7+5*x)^3*(2-3*x)^(1/2)/(2*x-5)^(1/2)/(4*x+1)^(1/2),x)`

[Out]
$$-1/36288*(2-3*x)^{(1/2)}*(2*x-5)^{(1/2)}*(4*x+1)^{(1/2)}*(75780147*11^{(1/2)}*(2-3*x)^{(1/2)}*(5-2*x)^{(1/2)}*(4*x+1)^{(1/2)}*\text{EllipticF}(2/11*(22-33*x)^{(1/2)},1/2*I*2^{(1/2)})-62518492*11^{(1/2)}*(2-3*x)^{(1/2)}*(5-2*x)^{(1/2)}*(4*x+1)^{(1/2)}*\text{EllipticE}(2/11*(22-33*x)^{(1/2)},1/2*I*2^{(1/2)})-3888000*x^5-21500640*x^4-57602160*x^3+407101740*x^2-144920790*x-62493900)/(24*x^3-70*x^2+21*x+10)$$

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(5x+7)^3 \sqrt{-3x+2}}{\sqrt{4x+1} \sqrt{2x-5}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((7+5*x)^3*(2-3*x)^(1/2)/(-5+2*x)^(1/2)/(1+4*x)^(1/2),x, algorithm="maxima")`

[Out] `integrate((5*x + 7)^3*sqrt(-3*x + 2)/(sqrt(4*x + 1)*sqrt(2*x - 5)), x)`

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{(125x^3 + 525x^2 + 735x + 343)\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2}}{8x^2 - 18x - 5}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((7+5*x)^3*(2-3*x)^(1/2)/(-5+2*x)^(1/2)/(1+4*x)^(1/2),x, algorithm="fricas")`

[Out] `integral((125*x^3 + 525*x^2 + 735*x + 343)*sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)/(8*x^2 - 18*x - 5), x)`

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((7+5*x)**3*(2-3*x)**(1/2)/(-5+2*x)**(1/2)/(1+4*x)**(1/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(5x+7)^3 \sqrt{-3x+2}}{\sqrt{4x+1} \sqrt{2x-5}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((7+5*x)^3*(2-3*x)^(1/2)/(-5+2*x)^(1/2)/(1+4*x)^(1/2),x, algorithm="giac")
```

```
[Out] integrate((5*x + 7)^3*sqrt(-3*x + 2)/(sqrt(4*x + 1)*sqrt(2*x - 5)), x)
```

$$3.52 \quad \int \frac{\sqrt{2-3x}(7+5x)^2}{\sqrt{-5+2x}\sqrt{1+4x}} dx$$

Optimal. Leaf size=167

$$\frac{17533\sqrt{\frac{11}{6}}\sqrt{5-2x}\text{EllipticF}\left(\sin^{-1}\left(\sqrt{\frac{3}{11}}\sqrt{4x+1}\right), \frac{1}{3}\right)}{72\sqrt{2x-5}} + \frac{1}{4}\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}(5x+7) + \frac{68}{9}\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}$$

[Out] (68*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/9 + (Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(7 + 5*x))/4 + (44569*Sqrt[11]*Sqrt[-5 + 2*x]*EllipticE[ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2])/(432*Sqrt[5 - 2*x]) - (17533*Sqrt[11/6]*Sqrt[5 - 2*x]*EllipticF[ArcSin[Sqrt[3/11]*Sqrt[1 + 4*x]], 1/3])/(72*Sqrt[-5 + 2*x])

Rubi [A] time = 0.145422, antiderivative size = 167, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}} = 0.2$, Rules used = {174, 1615, 158, 114, 113, 121, 119}

$$\frac{1}{4}\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}(5x+7) + \frac{68}{9}\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1} - \frac{17533\sqrt{\frac{11}{6}}\sqrt{5-2x}\text{EllipticF}\left(\sin^{-1}\left(\sqrt{\frac{3}{11}}\sqrt{4x+1}\right), \frac{1}{3}\right)}{72\sqrt{2x-5}} + \dots$$

Antiderivative was successfully verified.

[In] Int[(Sqrt[2 - 3*x]*(7 + 5*x)^2)/(Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]),x]

[Out] (68*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/9 + (Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(7 + 5*x))/4 + (44569*Sqrt[11]*Sqrt[-5 + 2*x]*EllipticE[ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2])/(432*Sqrt[5 - 2*x]) - (17533*Sqrt[11/6]*Sqrt[5 - 2*x]*EllipticF[ArcSin[Sqrt[3/11]*Sqrt[1 + 4*x]], 1/3])/(72*Sqrt[-5 + 2*x])

Rule 174

Int[(((a_.) + (b_.)*(x_))^(m_)*Sqrt[(c_.) + (d_.)*(x_)])/(Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] :> Simp[(2*b*(a + b*x)^(m - 1)*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(f*h*(2*m + 1)), x] - Dist[1/(f*h*(2*m + 1)), Int[((a + b*x)^(m - 2)/(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]))*Simp[a*b*(d*e*g + c*(f*g + e*h)) + 2*b^2*c*e*g*(m - 1) - a^2*c*f*h*(2*m + 1) + (b^2*(2*m - 1)*(d*e*g + c*(f*g + e*h)) - a^2*d*f*h*(2*m + 1) + 2*a*b*(d*f*g + d*e*h - 2*c*f*h*m))*x - b*(a*d*f*h*(4*m - 1) + b*(c*f*h - 2*

$d*(f*g + e*h)*m)*x^2, x], x], x] /; \text{FreeQ}\{a, b, c, d, e, f, g, h, m\}, x]$
 $\&\& \text{IntegerQ}[2*m] \&\& \text{GtQ}[m, 1]$

Rule 1615

$\text{Int}[(P_x)_*((a_.) + (b_.)*(x_.))^{(m_.)*((c_.) + (d_.)*(x_.))^{(n_.)*((e_.) + (f_.)*(x_.))^{(p_.)}, x_Symbol] \rightarrow \text{With}\{q = \text{Expon}[P_x, x], k = \text{Coeff}[P_x, x, \text{Expon}[P_x, x]]\}, \text{Simp}[(k*(a + b*x)^{(m + q - 1)}*(c + d*x)^{(n + 1)}*(e + f*x)^{(p + 1)})/(d*f*b^{(q - 1)}*(m + n + p + q + 1)), x] + \text{Dist}[1/(d*f*b^q*(m + n + p + q + 1)), \text{Int}[(a + b*x)^m*(c + d*x)^n*(e + f*x)^p*\text{ExpandToSum}[d*f*b^q*(m + n + p + q + 1)*P_x - d*f*k*(m + n + p + q + 1)*(a + b*x)^q + k*(a + b*x)^{(q - 2)}*(a^2*d*f*(m + n + p + q + 1) - b*(b*c*e*(m + q - 1) + a*(d*e*(n + 1) + c*f*(p + 1))) + b*(a*d*f*(2*(m + q) + n + p) - b*(d*e*(m + q + n) + c*f*(m + q + p)))*x], x], x] /; \text{NeQ}[m + n + p + q + 1, 0]] /; \text{FreeQ}\{a, b, c, d, e, f, m, n, p\}, x] \&\& \text{PolyQ}[P_x, x] \&\& \text{IntegersQ}[2*m, 2*n, 2*p]$

Rule 158

$\text{Int}[(g_.) + (h_.)*(x_.)]/(\text{Sqrt}[(a_.) + (b_.)*(x_.)]*\text{Sqrt}[(c_.) + (d_.)*(x_.)]*\text{Sqrt}[(e_.) + (f_.)*(x_.)]), x_Symbol] \rightarrow \text{Dist}[h/f, \text{Int}[\text{Sqrt}[e + f*x]/(\text{Sqrt}[a + b*x]*\text{Sqrt}[c + d*x]), x], x] + \text{Dist}[(f*g - e*h)/f, \text{Int}[1/(\text{Sqrt}[a + b*x]*\text{Sqrt}[c + d*x]*\text{Sqrt}[e + f*x]), x], x] /; \text{FreeQ}\{a, b, c, d, e, f, g, h\}, x] \&\& \text{SimplerQ}[a + b*x, e + f*x] \&\& \text{SimplerQ}[c + d*x, e + f*x]$

Rule 114

$\text{Int}[\text{Sqrt}[(e_.) + (f_.)*(x_.)]/(\text{Sqrt}[(a_.) + (b_.)*(x_.)]*\text{Sqrt}[(c_.) + (d_.)*(x_.)]), x_Symbol] \rightarrow \text{Dist}[(\text{Sqrt}[e + f*x]*\text{Sqrt}[(b*(c + d*x))/(b*c - a*d)])/(\text{Sqrt}[c + d*x]*\text{Sqrt}[(b*(e + f*x))/(b*e - a*f)]), \text{Int}[\text{Sqrt}[(b*e)/(b*e - a*f) + (b*f*x)/(b*e - a*f)]/(\text{Sqrt}[a + b*x]*\text{Sqrt}[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)]), x], x] /; \text{FreeQ}\{a, b, c, d, e, f\}, x] \&\& !(\text{GtQ}[b/(b*c - a*d), 0] \&\& \text{GtQ}[b/(b*e - a*f), 0]) \&\& !\text{LtQ}[-(b*c - a*d)/d, 0]$

Rule 113

$\text{Int}[\text{Sqrt}[(e_.) + (f_.)*(x_.)]/(\text{Sqrt}[(a_.) + (b_.)*(x_.)]*\text{Sqrt}[(c_.) + (d_.)*(x_.)]), x_Symbol] \rightarrow \text{Simp}[(2*\text{Rt}[-((b*e - a*f)/d), 2]*\text{EllipticE}[\text{ArcSin}[\text{Sqrt}[a + b*x]/\text{Rt}[-((b*c - a*d)/d), 2]], (f*(b*c - a*d))/(d*(b*e - a*f))]/b, x] /; \text{FreeQ}\{a, b, c, d, e, f\}, x] \&\& \text{GtQ}[b/(b*c - a*d), 0] \&\& \text{GtQ}[b/(b*e - a*f), 0] \&\& !\text{LtQ}[-((b*c - a*d)/d), 0] \&\& !(\text{SimplerQ}[c + d*x, a + b*x] \&\& \text{GtQ}[-(d/(b*c - a*d)), 0]) \&\& \text{GtQ}[d/(d*e - c*f), 0] \&\& !\text{LtQ}[(b*c - a*d)/b, 0]$

Rule 121

$\text{Int}[1/(\text{Sqrt}[(a_.) + (b_.)*(x_.)]*\text{Sqrt}[(c_.) + (d_.)*(x_.)]*\text{Sqrt}[(e_.) + (f_.)*(x_.)]), x]$

```

_)), x_Symbol] := Dist[Sqrt[(b*(c + d*x))/(b*c - a*d)]/Sqrt[c + d*x], Int[
1/(Sqrt[a + b*x]*Sqrt[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)]*Sqrt[e + f*x
]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && !GtQ[(b*c - a*d)/b, 0] && Si
mplerQ[a + b*x, c + d*x] && SimplerQ[a + b*x, e + f*x]

```

Rule 119

```

Int[1/(Sqrt[(a_) + (b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x
_)]), x_Symbol] := Simp[(2*Rt[-(b/d), 2]*EllipticF[ArcSin[Sqrt[a + b*x]/(Rt
[-(b/d), 2]*Sqrt[(b*c - a*d)/b]]], (f*(b*c - a*d))/(d*(b*e - a*f)))]/(b*Sqr
t[(b*e - a*f)/b]), x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[(b*c - a*d)/b,
0] && GtQ[(b*e - a*f)/b, 0] && PosQ[-(b/d)] && !(SimplerQ[c + d*x, a + b*
x] && GtQ[(d*e - c*f)/d, 0] && GtQ[-(d/b), 0]) && !(SimplerQ[c + d*x, a +
b*x] && GtQ[(-(b*e) + a*f)/f, 0] && GtQ[-(f/b), 0]) && !(SimplerQ[e + f*x,
a + b*x] && GtQ[(-(d*e) + c*f)/f, 0] && GtQ[(-(b*e) + a*f)/f, 0] && (PosQ[
-(f/d)] || PosQ[-(f/b)]))

```

Rubi steps

$$\begin{aligned}
\int \frac{\sqrt{2-3x}(7+5x)^2}{\sqrt{-5+2x}\sqrt{1+4x}} dx &= \frac{1}{4}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x) - \frac{1}{40} \int \frac{-5155+3605x+10880x^2}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}} dx \\
&= \frac{68}{9}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x} + \frac{1}{4}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x) - \frac{\int \frac{-899460+2674140x}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}}{4320} \\
&= \frac{68}{9}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x} + \frac{1}{4}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x) - \frac{44569}{144} \int \frac{\sqrt{-5+2x}}{\sqrt{2-3x}\sqrt{1+4x}} \\
&= \frac{68}{9}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x} + \frac{1}{4}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x) - \frac{(17533\sqrt{\frac{11}{2}}\sqrt{5-2x})}{72\sqrt{1+4x}} \\
&= \frac{68}{9}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x} + \frac{1}{4}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x) + \frac{44569\sqrt{11}\sqrt{-5+2x}}{432\sqrt{1+4x}}
\end{aligned}$$

Mathematica [A] time = 0.280988, size = 120, normalized size = 0.72

$$\frac{-35066\sqrt{66}\sqrt{5-2x}\text{EllipticF}\left(\sin^{-1}\left(\sqrt{\frac{3}{11}}\sqrt{4x+1}\right), \frac{1}{3}\right) + 120\sqrt{2-3x}\sqrt{4x+1}(18x^2+89x-335) + 44569\sqrt{66}\sqrt{5-2x}}{864\sqrt{2x-5}}$$

Antiderivative was successfully verified.

[In] Integrate[(Sqrt[2 - 3*x]*(7 + 5*x)^2)/(Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]),x]

[Out] (120*Sqrt[2 - 3*x]*Sqrt[1 + 4*x]*(-335 + 89*x + 18*x^2) + 44569*Sqrt[66]*Sqrt[5 - 2*x]*EllipticE[ArcSin[Sqrt[3/11]*Sqrt[1 + 4*x]], 1/3] - 35066*Sqrt[66]*Sqrt[5 - 2*x]*EllipticF[ArcSin[Sqrt[3/11]*Sqrt[1 + 4*x]], 1/3])/(864*Sqrt[-5 + 2*x])

Maple [A] time = 0.014, size = 145, normalized size = 0.9

$$\frac{1}{10368x^3 - 30240x^2 + 9072x + 4320} \sqrt{2-3x} \sqrt{2x-5} \sqrt{4x+1} \left(52599 \sqrt{11} \sqrt{2-3x} \sqrt{5-2x} \sqrt{4x+1} \text{EllipticF}\left(\frac{2}{11} \sqrt{\frac{2-3x}{4x+1}}, \frac{1}{2}\right) - 44569 \sqrt{11} \sqrt{2-3x} \sqrt{5-2x} \sqrt{4x+1} \text{EllipticE}\left(\frac{2}{11} \sqrt{\frac{2-3x}{4x+1}}, \frac{1}{2}\right) \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((7+5*x)^2*(2-3*x)^(1/2)/(2*x-5)^(1/2)/(4*x+1)^(1/2),x)

[Out] -1/432*(2-3*x)^(1/2)*(2*x-5)^(1/2)*(4*x+1)^(1/2)*(52599*11^(1/2)*(2-3*x)^(1/2)*(5-2*x)^(1/2)*(4*x+1)^(1/2)*EllipticF(2/11*(22-33*x)^(1/2),1/2*I*2^(1/2)))-44569*11^(1/2)*(2-3*x)^(1/2)*(5-2*x)^(1/2)*(4*x+1)^(1/2)*EllipticE(2/11*(22-33*x)^(1/2),1/2*I*2^(1/2))-12960*x^4-58680*x^3+270060*x^2-89820*x-40200)/(24*x^3-70*x^2+21*x+10)

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(5x+7)^2 \sqrt{-3x+2}}{\sqrt{4x+1} \sqrt{2x-5}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((7+5*x)^2*(2-3*x)^(1/2)/(-5+2*x)^(1/2)/(1+4*x)^(1/2),x, algorithm="maxima")

[Out] integrate((5*x + 7)^2*sqrt(-3*x + 2)/(sqrt(4*x + 1)*sqrt(2*x - 5)), x)

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{(25x^2 + 70x + 49)\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2}}{8x^2 - 18x - 5}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((7+5*x)^2*(2-3*x)^(1/2)/(-5+2*x)^(1/2)/(1+4*x)^(1/2),x, algorithm="fricas")
```

```
[Out] integral((25*x^2 + 70*x + 49)*sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)/(8*x^2 - 18*x - 5), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((7+5*x)**2*(2-3*x)**(1/2)/(-5+2*x)**(1/2)/(1+4*x)**(1/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(5x+7)^2 \sqrt{-3x+2}}{\sqrt{4x+1} \sqrt{2x-5}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((7+5*x)^2*(2-3*x)^(1/2)/(-5+2*x)^(1/2)/(1+4*x)^(1/2),x, algorithm="giac")
```

```
[Out] integrate((5*x + 7)^2*sqrt(-3*x + 2)/(sqrt(4*x + 1)*sqrt(2*x - 5)), x)
```

$$3.53 \quad \int \frac{\sqrt{2-3x}(7+5x)}{\sqrt{-5+2x}\sqrt{1+4x}} dx$$

Optimal. Leaf size=131

$$\frac{179\sqrt{\frac{11}{6}}\sqrt{5-2x}\text{EllipticF}\left(\sin^{-1}\left(\sqrt{\frac{3}{11}}\sqrt{4x+1}\right), \frac{1}{3}\right)}{12\sqrt{2x-5}} + \frac{5}{12}\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1} + \frac{241\sqrt{11}\sqrt{2x-5}E\left(\sin^{-1}\left(\frac{2\sqrt{2-3x}}{\sqrt{11}}\right)\right)}{36\sqrt{5-2x}}$$

[Out] (5*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/12 + (241*Sqrt[11]*Sqrt[-5 + 2*x]*EllipticE[ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2])/(36*Sqrt[5 - 2*x]) - (179*Sqrt[11/6]*Sqrt[5 - 2*x]*EllipticF[ArcSin[Sqrt[3/11]*Sqrt[1 + 4*x]], 1/3])/(12*Sqrt[-5 + 2*x])

Rubi [A] time = 0.0510921, antiderivative size = 131, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}} = 0.182$, Rules used = {154, 158, 114, 113, 121, 119}

$$\frac{5}{12}\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1} - \frac{179\sqrt{\frac{11}{6}}\sqrt{5-2x}F\left(\sin^{-1}\left(\sqrt{\frac{3}{11}}\sqrt{4x+1}\right), \frac{1}{3}\right)}{12\sqrt{2x-5}} + \frac{241\sqrt{11}\sqrt{2x-5}E\left(\sin^{-1}\left(\frac{2\sqrt{2-3x}}{\sqrt{11}}\right), -\frac{1}{2}\right)}{36\sqrt{5-2x}}$$

Antiderivative was successfully verified.

[In] Int[(Sqrt[2 - 3*x]*(7 + 5*x))/(Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]),x]

[Out] (5*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/12 + (241*Sqrt[11]*Sqrt[-5 + 2*x]*EllipticE[ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2])/(36*Sqrt[5 - 2*x]) - (179*Sqrt[11/6]*Sqrt[5 - 2*x]*EllipticF[ArcSin[Sqrt[3/11]*Sqrt[1 + 4*x]], 1/3])/(12*Sqrt[-5 + 2*x])

Rule 154

Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_)*((e_.) + (f_.)*(x_))^(p_)*((g_.) + (h_.)*(x_)), x_Symbol] := Simp[(h*(a + b*x)^(m*(c + d*x)^(n + 1)*(e + f*x)^(p + 1))/(d*f*(m + n + p + 2)), x] + Dist[1/(d*f*(m + n + p + 2)), Int[(a + b*x)^(m - 1)*(c + d*x)^n*(e + f*x)^p*Simp[a*d*f*g*(m + n + p + 2) - h*(b*c*e*m + a*(d*e*(n + 1) + c*f*(p + 1))) + (b*d*f*g*(m + n + p + 2) + h*(a*d*f*m - b*(d*e*(m + n + 1) + c*f*(m + p + 1)))]*x, x], x] / ; FreeQ[{a, b, c, d, e, f, g, h, n, p}, x] && GtQ[m, 0] && NeQ[m + n + p + 2, 0] && IntegersQ[2*m, 2*n, 2*p]

Rule 158

```
Int[((g_.) + (h_.)*(x_))/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]*
Sqrt[(e_.) + (f_.)*(x_)]), x_Symbol] := Dist[h/f, Int[Sqrt[e + f*x]/(Sqrt[a
+ b*x]*Sqrt[c + d*x]), x], x] + Dist[(f*g - e*h)/f, Int[1/(Sqrt[a + b*x]*Sq
rt[c + d*x]*Sqrt[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x] &&
SimplerQ[a + b*x, e + f*x] && SimplerQ[c + d*x, e + f*x]
```

Rule 114

```
Int[Sqrt[(e_.) + (f_.)*(x_)]/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_
)]), x_Symbol] := Dist[(Sqrt[e + f*x]*Sqrt[(b*(c + d*x))/(b*c - a*d)])/(Sqr
t[c + d*x]*Sqrt[(b*(e + f*x))/(b*e - a*f)]), Int[Sqrt[(b*e)/(b*e - a*f) + (
b*f*x)/(b*e - a*f)]/(Sqrt[a + b*x]*Sqrt[(b*c)/(b*c - a*d) + (b*d*x)/(b*c -
a*d)]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && !(GtQ[b/(b*c - a*d), 0]
&& GtQ[b/(b*e - a*f), 0]) && !LtQ[-((b*c - a*d)/d), 0]
```

Rule 113

```
Int[Sqrt[(e_.) + (f_.)*(x_)]/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_
)]), x_Symbol] := Simp[(2*Rt[-((b*e - a*f)/d), 2]*EllipticE[ArcSin[Sqrt[a +
b*x]/Rt[-((b*c - a*d)/d), 2]], (f*(b*c - a*d))/(d*(b*e - a*f)))]/b, x] /;
FreeQ[{a, b, c, d, e, f}, x] && GtQ[b/(b*c - a*d), 0] && GtQ[b/(b*e - a*f),
0] && !LtQ[-((b*c - a*d)/d), 0] && !(SimplerQ[c + d*x, a + b*x] && GtQ[-
(d/(b*c - a*d)), 0] && GtQ[d/(d*e - c*f), 0] && !LtQ[(b*c - a*d)/b, 0])
```

Rule 121

```
Int[1/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x
_)]), x_Symbol] := Dist[Sqrt[(b*(c + d*x))/(b*c - a*d)]/Sqrt[c + d*x], Int[
1/(Sqrt[a + b*x]*Sqrt[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)]*Sqrt[e + f*x
]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && !GtQ[(b*c - a*d)/b, 0] && Si
mplerQ[a + b*x, c + d*x] && SimplerQ[a + b*x, e + f*x]
```

Rule 119

```
Int[1/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x
_)]), x_Symbol] := Simp[(2*Rt[-(b/d), 2]*EllipticF[ArcSin[Sqrt[a + b*x]/(Rt
[-(b/d), 2]*Sqrt[(b*c - a*d)/b]])], (f*(b*c - a*d))/(d*(b*e - a*f)))]/(b*Sqr
t[(b*e - a*f)/b]), x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[(b*c - a*d)/b,
0] && GtQ[(b*e - a*f)/b, 0] && PosQ[-(b/d)] && !(SimplerQ[c + d*x, a + b*
x] && GtQ[(d*e - c*f)/d, 0] && GtQ[-(d/b), 0]) && !(SimplerQ[c + d*x, a +
b*x] && GtQ[(-(b*e) + a*f)/f, 0] && GtQ[-(f/b), 0]) && !(SimplerQ[e + f*x,
a + b*x] && GtQ[(-(d*e) + c*f)/f, 0] && GtQ[(-(b*e) + a*f)/f, 0] && (PosQ[
-(f/d)] || PosQ[-(f/b)]))
```

Rubi steps

$$\begin{aligned}
\int \frac{\sqrt{2-3x}(7+5x)}{\sqrt{-5+2x}\sqrt{1+4x}} dx &= \frac{5}{12} \sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x} + \frac{1}{12} \int \frac{\frac{441}{2} - 482x}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}} dx \\
&= \frac{5}{12} \sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x} - \frac{241}{12} \int \frac{\sqrt{-5+2x}}{\sqrt{2-3x}\sqrt{1+4x}} dx - \frac{1969}{24} \int \frac{1}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}} dx \\
&= \frac{5}{12} \sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x} - \frac{\left(179\sqrt{\frac{11}{2}}\sqrt{5-2x}\right) \int \frac{1}{\sqrt{2-3x}\sqrt{\frac{10-4x}{11}-\frac{4x}{11}}\sqrt{1+4x}} dx}{12\sqrt{-5+2x}} - \frac{(241\sqrt{-5+2x})}{12\sqrt{-5+2x}} \\
&= \frac{5}{12} \sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x} + \frac{241\sqrt{11}\sqrt{-5+2x}E\left(\sin^{-1}\left(\frac{2\sqrt{2-3x}}{\sqrt{11}}\right) \middle| -\frac{1}{2}\right)}{36\sqrt{5-2x}} - \frac{179\sqrt{\frac{11}{6}}\sqrt{5-2x}}{12\sqrt{-5+2x}}
\end{aligned}$$

Mathematica [A] time = 0.183481, size = 115, normalized size = 0.88

$$\frac{-179\sqrt{66}\sqrt{5-2x}\text{EllipticF}\left(\sin^{-1}\left(\sqrt{\frac{3}{11}}\sqrt{4x+1}\right), \frac{1}{3}\right) + 30\sqrt{2-3x}\sqrt{4x+1}(2x-5) + 241\sqrt{66}\sqrt{5-2x}E\left(\sin^{-1}\left(\sqrt{\frac{3}{11}}\sqrt{4x+1}\right) \middle| -\frac{1}{2}\right)}{72\sqrt{2x-5}}$$

Antiderivative was successfully verified.

[In] Integrate[(Sqrt[2 - 3*x]*(7 + 5*x))/(Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]), x]

[Out] (30*Sqrt[2 - 3*x]*(-5 + 2*x)*Sqrt[1 + 4*x] + 241*Sqrt[66]*Sqrt[5 - 2*x]*EllipticE[ArcSin[Sqrt[3/11]*Sqrt[1 + 4*x]], 1/3] - 179*Sqrt[66]*Sqrt[5 - 2*x]*EllipticF[ArcSin[Sqrt[3/11]*Sqrt[1 + 4*x]], 1/3])/(72*Sqrt[-5 + 2*x])

Maple [A] time = 0.012, size = 140, normalized size = 1.1

$$\frac{1}{1728x^3 - 5040x^2 + 1512x + 720} \sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1} \left(537\sqrt{11}\sqrt{2-3x}\sqrt{5-2x}\sqrt{4x+1}\text{EllipticF}\left(\frac{2}{11}\sqrt{22-3x}\right) \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((7+5*x)*(2-3*x)^(1/2)/(2*x-5)^(1/2)/(4*x+1)^(1/2), x)

[Out] $-1/72*(2-3*x)^{(1/2)}*(2*x-5)^{(1/2)}*(4*x+1)^{(1/2)}*(537*11^{(1/2)}*(2-3*x)^{(1/2)}*(5-2*x)^{(1/2)}*(4*x+1)^{(1/2)}*EllipticF(2/11*(22-33*x)^{(1/2)}, 1/2*I*2^{(1/2)})-482*11^{(1/2)}*(2-3*x)^{(1/2)}*(5-2*x)^{(1/2)}*(4*x+1)^{(1/2)}*EllipticE(2/11*(22-33*x)^{(1/2)}, 1/2*I*2^{(1/2)})-720*x^3+2100*x^2-630*x-300)/(24*x^3-70*x^2+21*x+10)$

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(5x+7)\sqrt{-3x+2}}{\sqrt{4x+1}\sqrt{2x-5}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((7+5*x)*(2-3*x)^(1/2)/(-5+2*x)^(1/2)/(1+4*x)^(1/2),x, algorithm="maxima")`

[Out] `integrate((5*x + 7)*sqrt(-3*x + 2)/(sqrt(4*x + 1)*sqrt(2*x - 5)), x)`

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{(5x+7)\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2}}{8x^2-18x-5}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((7+5*x)*(2-3*x)^(1/2)/(-5+2*x)^(1/2)/(1+4*x)^(1/2),x, algorithm="fricas")`

[Out] `integral((5*x + 7)*sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)/(8*x^2 - 18*x - 5), x)`

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{2-3x}(5x+7)}{\sqrt{2x-5}\sqrt{4x+1}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((7+5*x)*(2-3*x)**(1/2)/(-5+2*x)**(1/2)/(1+4*x)**(1/2),x)

[Out] Integral(sqrt(2 - 3*x)*(5*x + 7)/(sqrt(2*x - 5)*sqrt(4*x + 1)), x)

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(5x+7)\sqrt{-3x+2}}{\sqrt{4x+1}\sqrt{2x-5}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((7+5*x)*(2-3*x)^(1/2)/(-5+2*x)^(1/2)/(1+4*x)^(1/2),x, algorithm="giac")

[Out] integrate((5*x + 7)*sqrt(-3*x + 2)/(sqrt(4*x + 1)*sqrt(2*x - 5)), x)

$$3.54 \quad \int \frac{\sqrt{2-3x}}{\sqrt{-5+2x}\sqrt{1+4x}} dx$$

Optimal. Leaf size=47

$$\frac{\sqrt{\frac{11}{2}}\sqrt{5-2x}E\left(\sin^{-1}\left(\frac{\sqrt{4x+1}}{\sqrt{11}}\right)\middle|3\right)}{2\sqrt{2x-5}}$$

[Out] (Sqrt[11/2]*Sqrt[5 - 2*x]*EllipticE[ArcSin[Sqrt[1 + 4*x]/Sqrt[11]], 3])/(2*Sqrt[-5 + 2*x])

Rubi [A] time = 0.0148583, antiderivative size = 47, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}} = 0.071$, Rules used = {114, 113}

$$\frac{\sqrt{\frac{11}{2}}\sqrt{5-2x}E\left(\sin^{-1}\left(\frac{\sqrt{4x+1}}{\sqrt{11}}\right)\middle|3\right)}{2\sqrt{2x-5}}$$

Antiderivative was successfully verified.

[In] Int[Sqrt[2 - 3*x]/(Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]),x]

[Out] (Sqrt[11/2]*Sqrt[5 - 2*x]*EllipticE[ArcSin[Sqrt[1 + 4*x]/Sqrt[11]], 3])/(2*Sqrt[-5 + 2*x])

Rule 114

Int[Sqrt[(e_.) + (f_.)*(x_.)]/(Sqrt[(a_.) + (b_.)*(x_.)]*Sqrt[(c_.) + (d_.)*(x_.)]), x_Symbol] :> Dist[(Sqrt[e + f*x]*Sqrt[(b*(c + d*x))/(b*c - a*d]])/(Sqrt[c + d*x]*Sqrt[(b*(e + f*x))/(b*e - a*f)]), Int[Sqrt[(b*e)/(b*e - a*f) + (b*f*x)/(b*e - a*f)]/(Sqrt[a + b*x]*Sqrt[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && !(GtQ[b/(b*c - a*d), 0] && GtQ[b/(b*e - a*f), 0]) && !LtQ[-((b*c - a*d)/d), 0]

Rule 113

Int[Sqrt[(e_.) + (f_.)*(x_.)]/(Sqrt[(a_.) + (b_.)*(x_.)]*Sqrt[(c_.) + (d_.)*(x_.)]), x_Symbol] :> Simp[(2*Rt[-((b*e - a*f)/d), 2]*EllipticE[ArcSin[Sqrt[a + b*x]/Rt[-((b*c - a*d)/d), 2]], (f*(b*c - a*d))/(d*(b*e - a*f))]/b, x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[b/(b*c - a*d), 0] && GtQ[b/(b*e - a*f), 0]

0] && !LtQ[-((b*c - a*d)/d), 0] && !(SimplerQ[c + d*x, a + b*x] && GtQ[-(d/(b*c - a*d)), 0] && GtQ[d/(d*e - c*f), 0] && !LtQ[(b*c - a*d)/b, 0])

Rubi steps

$$\int \frac{\sqrt{2-3x}}{\sqrt{-5+2x}\sqrt{1+4x}} dx = \frac{\sqrt{5-2x} \int \frac{\sqrt{\frac{8}{11}-\frac{12x}{11}}}{\sqrt{\frac{10}{11}-\frac{4x}{11}}\sqrt{1+4x}} dx}{\sqrt{2}\sqrt{-5+2x}}$$

$$= \frac{\sqrt{\frac{11}{2}}\sqrt{5-2x}E\left(\sin^{-1}\left(\frac{\sqrt{1+4x}}{\sqrt{11}}\right)\middle|3\right)}{2\sqrt{-5+2x}}$$

Mathematica [B] time = 0.340403, size = 111, normalized size = 2.36

$$\frac{\frac{2(2x-5)(3x-2)}{\sqrt{2x+\frac{1}{2}}} + \sqrt{11}\sqrt{\frac{2x-5}{4x+1}}\sqrt{\frac{3x-2}{4x+1}}(4x+1)E\left(\sin^{-1}\left(\frac{\sqrt{\frac{11}{3}}}{\sqrt{4x+1}}\right)\middle|3\right)}{2\sqrt{2-3x}\sqrt{4x-10}}$$

Antiderivative was successfully verified.

[In] Integrate[Sqrt[2 - 3*x]/(Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]), x]

[Out] -((2*(-5 + 2*x)*(-2 + 3*x))/Sqrt[1/2 + 2*x] + Sqrt[11]*Sqrt[(-5 + 2*x)/(1 + 4*x)]*Sqrt[(-2 + 3*x)/(1 + 4*x)]*(1 + 4*x)*EllipticE[ArcSin[Sqrt[11/3]/Sqrt[1 + 4*x]], 3])/((2*Sqrt[2 - 3*x]*Sqrt[-10 + 4*x]))

Maple [C] time = 0.011, size = 55, normalized size = 1.2

$$\frac{\sqrt{11}}{2} \left(\text{EllipticF}\left(\frac{2}{11}\sqrt{22-33x}, \frac{i}{2}\sqrt{2}\right) - \text{EllipticE}\left(\frac{2}{11}\sqrt{22-33x}, \frac{i}{2}\sqrt{2}\right) \right) \sqrt{5-2x} \frac{1}{\sqrt{2x-5}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((2-3*x)^(1/2)/(2*x-5)^(1/2)/(4*x+1)^(1/2), x)

[Out] 1/2*(EllipticF(2/11*(22-33*x)^(1/2), 1/2*I*2^(1/2))-EllipticE(2/11*(22-33*x)^(1/2), 1/2*I*2^(1/2)))*(5-2*x)^(1/2)*11^(1/2)/(2*x-5)^(1/2)

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{-3x+2}}{\sqrt{4x+1}\sqrt{2x-5}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2-3*x)^(1/2)/(-5+2*x)^(1/2)/(1+4*x)^(1/2),x, algorithm="maxima")

[Out] integrate(sqrt(-3*x + 2)/(sqrt(4*x + 1)*sqrt(2*x - 5)), x)

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2}}{8x^2-18x-5}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2-3*x)^(1/2)/(-5+2*x)^(1/2)/(1+4*x)^(1/2),x, algorithm="fricas")

[Out] integral(sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)/(8*x^2 - 18*x - 5), x)

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{2-3x}}{\sqrt{2x-5}\sqrt{4x+1}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2-3*x)**(1/2)/(-5+2*x)**(1/2)/(1+4*x)**(1/2),x)

[Out] Integral(sqrt(2 - 3*x)/(sqrt(2*x - 5)*sqrt(4*x + 1)), x)

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{-3x+2}}{\sqrt{4x+1}\sqrt{2x-5}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((2-3*x)^(1/2)/(-5+2*x)^(1/2)/(1+4*x)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(sqrt(-3*x + 2)/(sqrt(4*x + 1)*sqrt(2*x - 5)), x)
```

$$3.55 \quad \int \frac{\sqrt{2-3x}}{\sqrt{-5+2x}\sqrt{1+4x}(7+5x)} dx$$

Optimal. Leaf size=103

$$-\frac{\sqrt{\frac{6}{11}}\sqrt{5-2x}\text{EllipticF}\left(\sin^{-1}\left(\sqrt{\frac{3}{11}}\sqrt{4x+1}\right), \frac{1}{3}\right)}{5\sqrt{2x-5}} - \frac{3\sqrt{5-2x}\Pi\left(\frac{55}{124}; \sin^{-1}\left(\frac{2\sqrt{2-3x}}{\sqrt{11}}\right) \middle| -\frac{1}{2}\right)}{5\sqrt{11}\sqrt{2x-5}}$$

[Out] -(Sqrt[6/11]*Sqrt[5 - 2*x]*EllipticF[ArcSin[Sqrt[3/11]*Sqrt[1 + 4*x]], 1/3])/ (5*Sqrt[-5 + 2*x]) - (3*Sqrt[5 - 2*x]*EllipticPi[55/124, ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2])/ (5*Sqrt[11]*Sqrt[-5 + 2*x])

Rubi [A] time = 0.0957722, antiderivative size = 103, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}} = 0.171$, Rules used = {175, 121, 119, 168, 538, 537}

$$-\frac{\sqrt{\frac{6}{11}}\sqrt{5-2x}F\left(\sin^{-1}\left(\sqrt{\frac{3}{11}}\sqrt{4x+1}\right) \middle| \frac{1}{3}\right)}{5\sqrt{2x-5}} - \frac{3\sqrt{5-2x}\Pi\left(\frac{55}{124}; \sin^{-1}\left(\frac{2\sqrt{2-3x}}{\sqrt{11}}\right) \middle| -\frac{1}{2}\right)}{5\sqrt{11}\sqrt{2x-5}}$$

Antiderivative was successfully verified.

[In] Int[Sqrt[2 - 3*x]/(Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(7 + 5*x)), x]

[Out] -(Sqrt[6/11]*Sqrt[5 - 2*x]*EllipticF[ArcSin[Sqrt[3/11]*Sqrt[1 + 4*x]], 1/3])/ (5*Sqrt[-5 + 2*x]) - (3*Sqrt[5 - 2*x]*EllipticPi[55/124, ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2])/ (5*Sqrt[11]*Sqrt[-5 + 2*x])

Rule 175

Int[Sqrt[(c_.) + (d_.)*(x_)]/(((a_.) + (b_.)*(x_))*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Dist[d/b, Int[1/(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]), x], x] + Dist[(b*c - a*d)/b, Int[1/((a + b*x)*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]), x], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x]

Rule 121

Int[1/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]), x_Symbol] := Dist[Sqrt[(b*(c + d*x))/(b*c - a*d)]/Sqrt[c + d*x], Int[1/(Sqrt[a + b*x]*Sqrt[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)]*Sqrt[e + f*x]

]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && !GtQ[(b*c - a*d)/b, 0] && SimplerQ[a + b*x, c + d*x] && SimplerQ[a + b*x, e + f*x]

Rule 119

Int[1/(Sqrt[(a_) + (b_)*(x_)]*Sqrt[(c_) + (d_)*(x_)]*Sqrt[(e_) + (f_)*(x_)]), x_Symbol] := Simp[(2*Rt[-(b/d), 2]*EllipticF[ArcSin[Sqrt[a + b*x]/Rt[-(b/d), 2]*Sqrt[(b*c - a*d)/b]]], (f*(b*c - a*d))/(d*(b*e - a*f)))/(b*Sqrt[(b*e - a*f)/b]), x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[(b*c - a*d)/b, 0] && GtQ[(b*e - a*f)/b, 0] && PosQ[-(b/d)] && !(SimplerQ[c + d*x, a + b*x] && GtQ[(d*e - c*f)/d, 0] && GtQ[-(d/b), 0]) && !(SimplerQ[c + d*x, a + b*x] && GtQ[-(b*e) + a*f/f, 0] && GtQ[-(f/b), 0]) && !(SimplerQ[e + f*x, a + b*x] && GtQ[-(d*e) + c*f/f, 0] && GtQ[-(b*e) + a*f/f, 0] && (PosQ[-(f/d)] || PosQ[-(f/b)]))

Rule 168

Int[1/(((a_) + (b_)*(x_))*Sqrt[(c_) + (d_)*(x_)]*Sqrt[(e_) + (f_)*(x_)]*Sqrt[(g_) + (h_)*(x_)]), x_Symbol] := Dist[-2, Subst[Int[1/(Simp[b*c - a*d - b*x^2, x]*Sqrt[Simp[(d*e - c*f)/d + (f*x^2)/d, x]]*Sqrt[Simp[(d*g - c*h)/d + (h*x^2)/d, x]]], x], x, Sqrt[c + d*x]], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x] && GtQ[(d*e - c*f)/d, 0]

Rule 538

Int[1/(((a_) + (b_)*(x_)^2)*Sqrt[(c_) + (d_)*(x_)^2]*Sqrt[(e_) + (f_)*(x_)^2]), x_Symbol] := Dist[Sqrt[1 + (d*x^2)/c]/Sqrt[c + d*x^2], Int[1/((a + b*x^2)*Sqrt[1 + (d*x^2)/c]*Sqrt[e + f*x^2]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && !GtQ[c, 0]

Rule 537

Int[1/(((a_) + (b_)*(x_)^2)*Sqrt[(c_) + (d_)*(x_)^2]*Sqrt[(e_) + (f_)*(x_)^2]), x_Symbol] := Simp[(1*EllipticPi[(b*c)/(a*d), ArcSin[Rt[-(d/c), 2]*x], (c*f)/(d*e)]/(a*Sqrt[c]*Sqrt[e]*Rt[-(d/c), 2]), x] /; FreeQ[{a, b, c, d, e, f}, x] && !GtQ[d/c, 0] && GtQ[c, 0] && GtQ[e, 0] && !(!GtQ[f/e, 0] && SimplerSqrtQ[-(f/e), -(d/c)])

Rubi steps

$$\begin{aligned}
\int \frac{\sqrt{2-3x}}{\sqrt{-5+2x}\sqrt{1+4x}(7+5x)} dx &= -\left(\frac{3}{5} \int \frac{1}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}} dx\right) + \frac{31}{5} \int \frac{1}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)} dx \\
&= -\left(\frac{62}{5} \text{Subst}\left(\int \frac{1}{(31-5x^2)\sqrt{\frac{11}{3}-\frac{4x^2}{3}}\sqrt{-\frac{11}{3}-\frac{2x^2}{3}}} dx, x, \sqrt{2-3x}\right)\right) - \frac{(3\sqrt{\frac{2}{11}}\sqrt{5-2x})}{5\sqrt{-5+2x}} \\
&= -\frac{\sqrt{\frac{6}{11}}\sqrt{5-2x}F\left(\sin^{-1}\left(\sqrt{\frac{3}{11}}\sqrt{1+4x}\right)\middle|\frac{1}{3}\right)}{5\sqrt{-5+2x}} - \frac{(62\sqrt{\frac{3}{11}}\sqrt{5-2x})\text{Subst}\left(\int \frac{1}{(31-5x^2)\sqrt{\frac{11}{3}-\frac{4x^2}{3}}} dx, x, \sqrt{2-3x}\right)}{5\sqrt{-5+2x}} \\
&= -\frac{\sqrt{\frac{6}{11}}\sqrt{5-2x}F\left(\sin^{-1}\left(\sqrt{\frac{3}{11}}\sqrt{1+4x}\right)\middle|\frac{1}{3}\right)}{5\sqrt{-5+2x}} - \frac{3\sqrt{5-2x}\Pi\left(\frac{55}{124}; \sin^{-1}\left(\frac{2\sqrt{2-3x}}{\sqrt{11}}\right)\middle|-\frac{1}{2}\right)}{5\sqrt{11}\sqrt{-5+2x}}
\end{aligned}$$

Mathematica [A] time = 0.400946, size = 70, normalized size = 0.68

$$\frac{3\sqrt{5-2x}\left(\text{EllipticF}\left(\sin^{-1}\left(\frac{2\sqrt{2-3x}}{\sqrt{11}}\right), -\frac{1}{2}\right) + \Pi\left(\frac{55}{124}; -\sin^{-1}\left(\frac{2\sqrt{2-3x}}{\sqrt{11}}\right)\middle|-\frac{1}{2}\right)\right)}{5\sqrt{22x-55}}$$

Antiderivative was successfully verified.

[In] Integrate[Sqrt[2 - 3*x]/(Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(7 + 5*x)), x]

[Out] (3*Sqrt[5 - 2*x]*(EllipticF[ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2] + EllipticPi[55/124, -ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2]))/(5*Sqrt[-55 + 22*x])

Maple [A] time = 0.015, size = 56, normalized size = 0.5

$$\frac{3\sqrt{11}}{55}\left(\text{EllipticF}\left(\frac{2}{11}\sqrt{22-33x}, \frac{i}{2}\sqrt{2}\right) - \text{EllipticPi}\left(\frac{2}{11}\sqrt{22-33x}, \frac{55}{124}, \frac{i}{2}\sqrt{2}\right)\right)\sqrt{5-2x}\frac{1}{\sqrt{2x-5}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((2-3*x)^(1/2)/(7+5*x)/(2*x-5)^(1/2)/(4*x+1)^(1/2), x)

[Out] $3/55*(\text{EllipticF}(2/11*(22-33*x)^{(1/2)}, 1/2*I*2^{(1/2)})-\text{EllipticPi}(2/11*(22-33*x)^{(1/2)}, 55/124, 1/2*I*2^{(1/2)}))*(5-2*x)^{(1/2)*11^{(1/2)}}/(2*x-5)^{(1/2)}$

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{-3x+2}}{(5x+7)\sqrt{4x+1}\sqrt{2x-5}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((2-3*x)^(1/2)/(7+5*x)/(-5+2*x)^(1/2)/(1+4*x)^(1/2),x, algorithm="maxima")`

[Out] `integrate(sqrt(-3*x + 2)/((5*x + 7)*sqrt(4*x + 1)*sqrt(2*x - 5)), x)`

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2}}{40x^3-34x^2-151x-35}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((2-3*x)^(1/2)/(7+5*x)/(-5+2*x)^(1/2)/(1+4*x)^(1/2),x, algorithm="fricas")`

[Out] `integral(sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)/(40*x^3 - 34*x^2 - 151*x - 35), x)`

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{2-3x}}{\sqrt{2x-5}\sqrt{4x+1}(5x+7)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((2-3*x)**(1/2)/(7+5*x)/(-5+2*x)**(1/2)/(1+4*x)**(1/2),x)`

[Out] Integral(sqrt(2 - 3*x)/(sqrt(2*x - 5)*sqrt(4*x + 1)*(5*x + 7)), x)

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{-3x+2}}{(5x+7)\sqrt{4x+1}\sqrt{2x-5}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2-3*x)^(1/2)/(7+5*x)/(-5+2*x)^(1/2)/(1+4*x)^(1/2),x, algorithm="giac")

[Out] integrate(sqrt(-3*x + 2)/((5*x + 7)*sqrt(4*x + 1)*sqrt(2*x - 5)), x)

$$3.56 \quad \int \frac{\sqrt{2-3x}}{\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^2} dx$$

Optimal. Leaf size=189

$$\frac{2\sqrt{\frac{6}{11}}\sqrt{5-2x}\text{EllipticF}\left(\sin^{-1}\left(\sqrt{\frac{3}{11}}\sqrt{4x+1}\right), \frac{1}{3}\right)}{115\sqrt{2x-5}} - \frac{5\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}}{897(5x+7)} + \frac{2\sqrt{11}\sqrt{2x-5}E\left(\sin^{-1}\left(\frac{2\sqrt{2-3x}}{\sqrt{11}}\right)\middle|-\frac{1}{2}\right)}{897\sqrt{5-2x}}$$

```
[Out] (-5*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/(897*(7 + 5*x)) + (2*Sqrt[1
1]*Sqrt[-5 + 2*x]*EllipticE[ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2])/(897
*Sqrt[5 - 2*x]) - (2*Sqrt[6/11]*Sqrt[5 - 2*x]*EllipticF[ArcSin[Sqrt[3/11]*S
qrt[1 + 4*x]], 1/3])/(115*Sqrt[-5 + 2*x]) - (3571*Sqrt[5 - 2*x]*EllipticPi[
55/124, ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2])/(92690*Sqrt[11]*Sqrt[-5
+ 2*x])
```

Rubi [A] time = 0.209679, antiderivative size = 189, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 10, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}} = 0.286$, Rules used = {177, 1607, 168, 538, 537, 158, 114, 113, 121, 119}

$$\frac{5\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}}{897(5x+7)} - \frac{2\sqrt{\frac{6}{11}}\sqrt{5-2x}F\left(\sin^{-1}\left(\sqrt{\frac{3}{11}}\sqrt{4x+1}\right)\middle|\frac{1}{3}\right)}{115\sqrt{2x-5}} + \frac{2\sqrt{11}\sqrt{2x-5}E\left(\sin^{-1}\left(\frac{2\sqrt{2-3x}}{\sqrt{11}}\right)\middle|-\frac{1}{2}\right)}{897\sqrt{5-2x}} - \frac{3571}{92690}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[2 - 3*x]/(Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(7 + 5*x)^2), x]
```

```
[Out] (-5*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/(897*(7 + 5*x)) + (2*Sqrt[1
1]*Sqrt[-5 + 2*x]*EllipticE[ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2])/(897
*Sqrt[5 - 2*x]) - (2*Sqrt[6/11]*Sqrt[5 - 2*x]*EllipticF[ArcSin[Sqrt[3/11]*S
qrt[1 + 4*x]], 1/3])/(115*Sqrt[-5 + 2*x]) - (3571*Sqrt[5 - 2*x]*EllipticPi[
55/124, ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2])/(92690*Sqrt[11]*Sqrt[-5
+ 2*x])
```

Rule 177

```
Int[(((a_.) + (b_.)*(x_))^(m_)*Sqrt[(c_.) + (d_.)*(x_)])/(Sqrt[(e_.) + (f_.
)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Simp[(b*(a + b*x)^(m + 1)*S
qrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/((m + 1)*(b*e - a*f)*(b*g - a*h))
, x] + Dist[1/(2*(m + 1)*(b*e - a*f)*(b*g - a*h)), Int[((a + b*x)^(m + 1)/(
Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]))*Simp[2*a*c*f*h*(m + 1) - b*(d*e
```


g + c(2*m + 3)*(f*g + e*h) + 2*(a*d*f*h*(m + 1) - b*(m + 2)*(d*f*g + d*e*h + c*f*h))*x - b*d*f*h*(2*m + 5)*x^2, x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m}, x] && IntegerQ[2*m] && LeQ[m, -2]

Rule 1607

Int[(Px_)*((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p_.)*((g_.) + (h_.)*(x_))^(q_.), x_Symbol] := Dist[PolynomialRemainder[Px, a + b*x, x], Int[(a + b*x)^m*(c + d*x)^n*(e + f*x)^p*(g + h*x)^q, x], x] + Int[PolynomialQuotient[Px, a + b*x, x]*(a + b*x)^(m + 1)*(c + d*x)^n*(e + f*x)^p*(g + h*x)^q, x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n, p, q}, x] && PolyQ[Px, x] && EqQ[m, -1]

Rule 168

Int[1/(((a_.) + (b_.)*(x_))*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Dist[-2, Subst[Int[1/(Simp[b*c - a*d - b*x^2, x]*Sqrt[Simp[(d*e - c*f)/d + (f*x^2)/d, x]]*Sqrt[Simp[(d*g - c*h)/d + (h*x^2)/d, x]]), x], x, Sqrt[c + d*x], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x] && GtQ[(d*e - c*f)/d, 0]

Rule 538

Int[1/(((a_) + (b_.)*(x_)^2)*Sqrt[(c_) + (d_.)*(x_)^2]*Sqrt[(e_) + (f_.)*(x_)^2]), x_Symbol] := Dist[Sqrt[1 + (d*x^2)/c]/Sqrt[c + d*x^2], Int[1/((a + b*x^2)*Sqrt[1 + (d*x^2)/c]*Sqrt[e + f*x^2]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && !GtQ[c, 0]

Rule 537

Int[1/(((a_) + (b_.)*(x_)^2)*Sqrt[(c_) + (d_.)*(x_)^2]*Sqrt[(e_) + (f_.)*(x_)^2]), x_Symbol] := Simp[(1*EllipticPi[(b*c)/(a*d), ArcSin[Rt[-(d/c), 2]*x], (c*f)/(d*e)]/(a*Sqrt[c]*Sqrt[e]*Rt[-(d/c), 2]), x] /; FreeQ[{a, b, c, d, e, f}, x] && !GtQ[d/c, 0] && GtQ[c, 0] && GtQ[e, 0] && !(!GtQ[f/e, 0] && SimplerSqrtQ[-(f/e), -(d/c)])

Rule 158

Int[((g_.) + (h_.)*(x_))/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x_)]), x_Symbol] := Dist[h/f, Int[Sqrt[e + f*x]/(Sqrt[a + b*x]*Sqrt[c + d*x]), x], x] + Dist[(f*g - e*h)/f, Int[1/(Sqrt[a + b*x]*Sqrt[c + d*x]*Sqrt[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x] && SimplerQ[a + b*x, e + f*x] && SimplerQ[c + d*x, e + f*x]

Rule 114

```
Int[Sqrt[(e_.) + (f_.)*(x_.)]/(Sqrt[(a_.) + (b_.)*(x_.)]*Sqrt[(c_.) + (d_.)*(x_.)]), x_Symbol] := Dist[(Sqrt[e + f*x]*Sqrt[(b*(c + d*x))/(b*c - a*d)])/(Sqrt[c + d*x]*Sqrt[(b*(e + f*x))/(b*e - a*f)])], Int[Sqrt[(b*e)/(b*e - a*f) + (b*f*x)/(b*e - a*f)]/(Sqrt[a + b*x]*Sqrt[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)])], x], x] /; FreeQ[{a, b, c, d, e, f}, x] && !(GtQ[b/(b*c - a*d), 0] && GtQ[b/(b*e - a*f), 0]) && !LtQ[-((b*c - a*d)/d), 0]
```

Rule 113

```
Int[Sqrt[(e_.) + (f_.)*(x_.)]/(Sqrt[(a_.) + (b_.)*(x_.)]*Sqrt[(c_.) + (d_.)*(x_.)]), x_Symbol] := Simp[(2*Rt[-((b*e - a*f)/d), 2]*EllipticE[ArcSin[Sqrt[a + b*x]/Rt[-((b*c - a*d)/d), 2]], (f*(b*c - a*d))/(d*(b*e - a*f))]/b, x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[b/(b*c - a*d), 0] && GtQ[b/(b*e - a*f), 0] && !LtQ[-((b*c - a*d)/d), 0] && !(SimplerQ[c + d*x, a + b*x] && GtQ[-(d/(b*c - a*d)), 0] && GtQ[d/(d*e - c*f), 0] && !LtQ[(b*c - a*d)/b, 0])
```

Rule 121

```
Int[1/(Sqrt[(a_.) + (b_.)*(x_.)]*Sqrt[(c_.) + (d_.)*(x_.)]*Sqrt[(e_.) + (f_.)*(x_.)]), x_Symbol] := Dist[Sqrt[(b*(c + d*x))/(b*c - a*d)]/Sqrt[c + d*x], Int[1/(Sqrt[a + b*x]*Sqrt[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)]*Sqrt[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && !GtQ[(b*c - a*d)/b, 0] && SimplerQ[a + b*x, c + d*x] && SimplerQ[a + b*x, e + f*x]
```

Rule 119

```
Int[1/(Sqrt[(a_.) + (b_.)*(x_.)]*Sqrt[(c_.) + (d_.)*(x_.)]*Sqrt[(e_.) + (f_.)*(x_.)]), x_Symbol] := Simp[(2*Rt[-(b/d), 2]*EllipticF[ArcSin[Sqrt[a + b*x]/Rt[-(b/d), 2]*Sqrt[(b*c - a*d)/b]]], (f*(b*c - a*d))/(d*(b*e - a*f))]/(b*Sqrt[(b*e - a*f)/b]), x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[(b*c - a*d)/b, 0] && GtQ[(b*e - a*f)/b, 0] && PosQ[-(b/d)] && !(SimplerQ[c + d*x, a + b*x] && GtQ[(d*e - c*f)/d, 0] && GtQ[-(d/b), 0]) && !(SimplerQ[c + d*x, a + b*x] && GtQ[-(b*e) + a*f, 0] && GtQ[-(f/b), 0]) && !(SimplerQ[e + f*x, a + b*x] && GtQ[-(d*e) + c*f, 0] && GtQ[-(b*e) + a*f, 0] && (PosQ[-(f/d)] || PosQ[-(f/b)]))
```

Rubi steps

$$\begin{aligned}
\int \frac{\sqrt{2-3x}}{\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^2} dx &= -\frac{5\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{897(7+5x)} - \frac{\int \frac{-479+336x+120x^2}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)} dx}{1794} \\
&= -\frac{5\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{897(7+5x)} - \frac{\int \frac{\frac{168}{5}+24x}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}} dx}{1794} + \frac{3571 \int \frac{1}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}} dx}{8970} \\
&= -\frac{5\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{897(7+5x)} - \frac{2}{299} \int \frac{\sqrt{-5+2x}}{\sqrt{2-3x}\sqrt{1+4x}} dx - \frac{6}{115} \int \frac{1}{\sqrt{2-3x}\sqrt{-5+2x}} dx \\
&= -\frac{5\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{897(7+5x)} - \frac{\left(6\sqrt{\frac{2}{11}}\sqrt{5-2x}\right) \int \frac{1}{\sqrt{2-3x}\sqrt{\frac{10}{11}-\frac{4x}{11}}\sqrt{1+4x}} dx}{115\sqrt{-5+2x}} - \frac{(3571 \int \frac{1}{\sqrt{2-3x}\sqrt{-5+2x}} dx)}{8970} \\
&= -\frac{5\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{897(7+5x)} + \frac{2\sqrt{11}\sqrt{-5+2x}E\left(\sin^{-1}\left(\frac{2\sqrt{2-3x}}{\sqrt{11}}\right)\middle|-\frac{1}{2}\right)}{897\sqrt{5-2x}} - \frac{2\sqrt{\frac{6}{11}}\sqrt{5-2x}}{115}
\end{aligned}$$

Mathematica [A] time = 0.653042, size = 132, normalized size = 0.7

$$\frac{3\sqrt{55-22x}\left(14508\text{EllipticF}\left(\sin^{-1}\left(\frac{2\sqrt{2-3x}}{\sqrt{11}}\right),-\frac{1}{2}\right)-6820E\left(\sin^{-1}\left(\frac{2\sqrt{2-3x}}{\sqrt{11}}\right)\middle|-\frac{1}{2}\right)+10713\text{Pi}\left(\frac{55}{124};-\sin^{-1}\left(\frac{2\sqrt{2-3x}}{\sqrt{11}}\right)\middle|-\frac{1}{2}\right)\right)}{9176310\sqrt{2x-5}}$$

Antiderivative was successfully verified.

[In] Integrate[Sqrt[2 - 3*x]/(Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(7 + 5*x)^2),x]

[Out] ((-51150*Sqrt[2 - 3*x]*(-5 + 2*x)*Sqrt[1 + 4*x])/(7 + 5*x) + 3*Sqrt[55 - 22*x]*(-6820*EllipticE[ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2] + 14508*EllipticF[ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2] + 10713*EllipticPi[55/124, -ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2]))/(9176310*Sqrt[-5 + 2*x])

Maple [B] time = 0.016, size = 320, normalized size = 1.7

$$-\frac{1}{(73410480x^3 - 214113900x^2 + 64234170x + 30587700)(7+5x)}\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}\left(72540\sqrt{11}\sqrt{2-3x}\sqrt{5}
\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((2-3*x)^(1/2)/(7+5*x)^2/(2*x-5)^(1/2)/(4*x+1)^(1/2),x)

[Out]
$$\begin{aligned} & -1/3058770*(2-3*x)^{(1/2)}*(2*x-5)^{(1/2)}*(4*x+1)^{(1/2)}*(72540*11^{(1/2)}*(2-3*x) \\ &)^{(1/2)}*(5-2*x)^{(1/2)}*(4*x+1)^{(1/2)}*\text{EllipticF}(2/11*(22-33*x)^{(1/2)},1/2*I*2^{(1/2)}) \\ & *x-34100*11^{(1/2)}*(2-3*x)^{(1/2)}*(5-2*x)^{(1/2)}*(4*x+1)^{(1/2)}*\text{EllipticE} \\ & (2/11*(22-33*x)^{(1/2)},1/2*I*2^{(1/2)})*x-53565*11^{(1/2)}*(2-3*x)^{(1/2)}*(5-2*x) \\ & ^{(1/2)}*(4*x+1)^{(1/2)}*\text{EllipticPi}(2/11*(22-33*x)^{(1/2)},55/124,1/2*I*2^{(1/2)})* \\ & x+101556*11^{(1/2)}*(2-3*x)^{(1/2)}*(5-2*x)^{(1/2)}*(4*x+1)^{(1/2)}*\text{EllipticF}(2/11* \\ & (22-33*x)^{(1/2)},1/2*I*2^{(1/2)})-47740*11^{(1/2)}*(2-3*x)^{(1/2)}*(5-2*x)^{(1/2)}*(\\ & 4*x+1)^{(1/2)}*\text{EllipticE}(2/11*(22-33*x)^{(1/2)},1/2*I*2^{(1/2)})-74991*11^{(1/2)}*(\\ & 2-3*x)^{(1/2)}*(5-2*x)^{(1/2)}*(4*x+1)^{(1/2)}*\text{EllipticPi}(2/11*(22-33*x)^{(1/2)},55 \\ & /124,1/2*I*2^{(1/2)})+409200*x^3-1193500*x^2+358050*x+170500)/(24*x^3-70*x^2+ \\ & 21*x+10)/(7+5*x) \end{aligned}$$

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{-3x+2}}{(5x+7)^2\sqrt{4x+1}\sqrt{2x-5}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2-3*x)^(1/2)/(7+5*x)^2/(-5+2*x)^(1/2)/(1+4*x)^(1/2),x, algorithm="maxima")

[Out] integrate(sqrt(-3*x + 2)/((5*x + 7)^2*sqrt(4*x + 1)*sqrt(2*x - 5)), x)

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2}}{200x^4+110x^3-993x^2-1232x-245},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2-3*x)^(1/2)/(7+5*x)^2/(-5+2*x)^(1/2)/(1+4*x)^(1/2),x, algorithm="fricas")

[Out] integral(sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)/(200*x^4 + 110*x^3 - 993*x^2 - 1232*x - 245), x)

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2-3*x)**(1/2)/(7+5*x)**2/(-5+2*x)**(1/2)/(1+4*x)**(1/2),x)

[Out] Timed out

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{-3x+2}}{(5x+7)^2\sqrt{4x+1}\sqrt{2x-5}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2-3*x)^(1/2)/(7+5*x)^2/(-5+2*x)^(1/2)/(1+4*x)^(1/2),x, algorithm="giac")

[Out] integrate(sqrt(-3*x + 2)/((5*x + 7)^2*sqrt(4*x + 1)*sqrt(2*x - 5)), x)

$$3.57 \quad \int \frac{\sqrt{2-3x}}{\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^3} dx$$

Optimal. Leaf size=225

$$\frac{13243\sqrt{5-2x}\text{EllipticF}\left(\sin^{-1}\left(\sqrt{\frac{3}{11}}\sqrt{4x+1}\right), \frac{1}{3}\right)}{1065935\sqrt{66}\sqrt{2x-5}} - \frac{26825\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}}{33257172(5x+7)} - \frac{5\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}}{1794(5x+7)^2} + \frac{5365\sqrt{11}\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}}{1065935\sqrt{66}\sqrt{2x-5}}$$

[Out] (-5*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/(1794*(7 + 5*x)^2) - (26825*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/(33257172*(7 + 5*x)) + (5365*Sqrt[11]*Sqrt[-5 + 2*x]*EllipticE[ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2])/(16628586*Sqrt[5 - 2*x]) - (13243*Sqrt[5 - 2*x]*EllipticF[ArcSin[Sqrt[3/11]*Sqrt[1 + 4*x]], 1/3])/(1065935*Sqrt[66]*Sqrt[-5 + 2*x]) - (16369941*Sqrt[5 - 2*x]*EllipticPi[55/124, ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2])/(3436574440*Sqrt[11]*Sqrt[-5 + 2*x])

Rubi [A] time = 0.310402, antiderivative size = 225, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 11, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}} = 0.314$, Rules used = {177, 1604, 1607, 168, 538, 537, 158, 114, 113, 121, 119}

$$\frac{26825\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}}{33257172(5x+7)} - \frac{5\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}}{1794(5x+7)^2} - \frac{13243\sqrt{5-2x}F\left(\sin^{-1}\left(\sqrt{\frac{3}{11}}\sqrt{4x+1}\right)\middle|\frac{1}{3}\right)}{1065935\sqrt{66}\sqrt{2x-5}} + \frac{5365\sqrt{11}\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}}{1065935\sqrt{66}\sqrt{2x-5}}$$

Antiderivative was successfully verified.

[In] Int[Sqrt[2 - 3*x]/(Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(7 + 5*x)^3), x]

[Out] (-5*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/(1794*(7 + 5*x)^2) - (26825*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/(33257172*(7 + 5*x)) + (5365*Sqrt[11]*Sqrt[-5 + 2*x]*EllipticE[ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2])/(16628586*Sqrt[5 - 2*x]) - (13243*Sqrt[5 - 2*x]*EllipticF[ArcSin[Sqrt[3/11]*Sqrt[1 + 4*x]], 1/3])/(1065935*Sqrt[66]*Sqrt[-5 + 2*x]) - (16369941*Sqrt[5 - 2*x]*EllipticPi[55/124, ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2])/(3436574440*Sqrt[11]*Sqrt[-5 + 2*x])

Rule 177

Int[(((a_.) + (b_.)*(x_))^(m_)*Sqrt[(c_.) + (d_.)*(x_)])/(Sqrt[(e_.) + (f_.)*(x_)])*Sqrt[(g_.) + (h_.)*(x_)], x_Symbol] := Simp[(b*(a + b*x)^(m + 1)*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/((m + 1)*(b*e - a*f)*(b*g - a*h))

```
, x] + Dist[1/(2*(m + 1)*(b*e - a*f)*(b*g - a*h)), Int[((a + b*x)^(m + 1)/(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]))*Simp[2*a*c*f*h*(m + 1) - b*(d*e*g + c*(2*m + 3)*(f*g + e*h)) + 2*(a*d*f*h*(m + 1) - b*(m + 2)*(d*f*g + d*e*h + c*f*h))*x - b*d*f*h*(2*m + 5)*x^2, x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m}, x] && IntegerQ[2*m] && LeQ[m, -2]
```

Rule 1604

```
Int[(((a_.) + (b_.)*(x_))^(m_.)*((A_.) + (B_.)*(x_) + (C_.)*(x_)^2))/(Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Simp[((A*b^2 - a*b*B + a^2*C)*(a + b*x)^(m + 1)*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/((m + 1)*(b*c - a*d)*(b*e - a*f)*(b*g - a*h)), x] - Dist[1/(2*(m + 1)*(b*c - a*d)*(b*e - a*f)*(b*g - a*h)), Int[((a + b*x)^(m + 1)/(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]))*Simp[A*(2*a^2*d*f*h*(m + 1) - 2*a*b*(m + 1)*(d*f*g + d*e*h + c*f*h) + b^2*(2*m + 3)*(d*e*g + c*f*g + c*e*h)) - (b*B - a*C)*(a*(d*e*g + c*f*g + c*e*h) + 2*b*c*e*g*(m + 1)) - 2*((A*b - a*B)*(a*d*f*h*(m + 1) - b*(m + 2)*(d*f*g + d*e*h + c*f*h)) - C*(a^2*(d*f*g + d*e*h + c*f*h) - b^2*c*e*g*(m + 1) + a*b*(m + 1)*(d*e*g + c*f*g + c*e*h)))*x + d*f*h*(2*m + 5)*(A*b^2 - a*b*B + a^2*C)*x^2, x], x] /; FreeQ[{a, b, c, d, e, f, g, h, A, B, C}, x] && IntegerQ[2*m] && LtQ[m, -1]
```

Rule 1607

```
Int[(Px_)*((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p_.)*((g_.) + (h_.)*(x_))^(q_.), x_Symbol] := Dist[PolynomialRemainder[Px, a + b*x, x], Int[(a + b*x)^m*(c + d*x)^n*(e + f*x)^p*(g + h*x)^q, x], x] + Int[PolynomialQuotient[Px, a + b*x, x]*(a + b*x)^(m + 1)*(c + d*x)^n*(e + f*x)^p*(g + h*x)^q, x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n, p, q}, x] && PolyQ[Px, x] && EqQ[m, -1]
```

Rule 168

```
Int[1/(((a_.) + (b_.)*(x_))*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Dist[-2, Subst[Int[1/(Simp[b*c - a*d - b*x^2, x]*Sqrt[Simp[(d*e - c*f)/d + (f*x^2)/d, x]]*Sqrt[Simp[(d*g - c*h)/d + (h*x^2)/d, x]]), x], x, Sqrt[c + d*x]], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x] && GtQ[(d*e - c*f)/d, 0]
```

Rule 538

```
Int[1/(((a_) + (b_.)*(x_)^2)*Sqrt[(c_) + (d_.)*(x_)^2]*Sqrt[(e_) + (f_.)*(x_)^2]), x_Symbol] := Dist[Sqrt[1 + (d*x^2)/c]/Sqrt[c + d*x^2], Int[1/((a + b*x^2)*Sqrt[1 + (d*x^2)/c]*Sqrt[e + f*x^2]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && !GtQ[c, 0]
```

Rule 537

```
Int[1/(((a_) + (b_)*(x_)^2)*Sqrt[(c_) + (d_)*(x_)^2]*Sqrt[(e_) + (f_)*(x_)^2]), x_Symbol] :> Simp[(1*EllipticPi[(b*c)/(a*d), ArcSin[Rt[-(d/c), 2]*x], (c*f)/(d*e))]/(a*Sqrt[c]*Sqrt[e]*Rt[-(d/c), 2]), x] /; FreeQ[{a, b, c, d, e, f}, x] && !GtQ[d/c, 0] && GtQ[c, 0] && GtQ[e, 0] && !(GtQ[f/e, 0] && SimplifierSqrtQ[-(f/e), -(d/c)])
```

Rule 158

```
Int[((g_) + (h_)*(x_))/(Sqrt[(a_) + (b_)*(x_)]*Sqrt[(c_) + (d_)*(x_)]*Sqrt[(e_) + (f_)*(x_)]), x_Symbol] :> Dist[h/f, Int[Sqrt[e + f*x]/(Sqrt[a + b*x]*Sqrt[c + d*x]), x], x] + Dist[(f*g - e*h)/f, Int[1/(Sqrt[a + b*x]*Sqrt[c + d*x]*Sqrt[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x] && SimplifierQ[a + b*x, e + f*x] && SimplifierQ[c + d*x, e + f*x]
```

Rule 114

```
Int[Sqrt[(e_) + (f_)*(x_)]/(Sqrt[(a_) + (b_)*(x_)]*Sqrt[(c_) + (d_)*(x_)]), x_Symbol] :> Dist[(Sqrt[e + f*x]*Sqrt[(b*(c + d*x))/(b*c - a*d)])/(Sqrt[c + d*x]*Sqrt[(b*(e + f*x))/(b*e - a*f)]), Int[Sqrt[(b*e)/(b*e - a*f) + (b*f*x)/(b*e - a*f)]/(Sqrt[a + b*x]*Sqrt[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && !(GtQ[b/(b*c - a*d), 0] && GtQ[b/(b*e - a*f), 0]) && !LtQ[-((b*c - a*d)/d), 0]
```

Rule 113

```
Int[Sqrt[(e_) + (f_)*(x_)]/(Sqrt[(a_) + (b_)*(x_)]*Sqrt[(c_) + (d_)*(x_)]), x_Symbol] :> Simp[(2*Rt[-((b*e - a*f)/d), 2]*EllipticE[ArcSin[Sqrt[a + b*x]/Rt[-((b*c - a*d)/d), 2]], (f*(b*c - a*d))/(d*(b*e - a*f))]/b, x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[b/(b*c - a*d), 0] && GtQ[b/(b*e - a*f), 0] && !LtQ[-((b*c - a*d)/d), 0] && !(SimplifierQ[c + d*x, a + b*x] && GtQ[-(d/(b*c - a*d)), 0] && GtQ[d/(d*e - c*f), 0] && !LtQ[(b*c - a*d)/b, 0])
```

Rule 121

```
Int[1/(Sqrt[(a_) + (b_)*(x_)]*Sqrt[(c_) + (d_)*(x_)]*Sqrt[(e_) + (f_)*(x_)]), x_Symbol] :> Dist[Sqrt[(b*(c + d*x))/(b*c - a*d)]/Sqrt[c + d*x], Int[1/(Sqrt[a + b*x]*Sqrt[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)]*Sqrt[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && !GtQ[(b*c - a*d)/b, 0] && SimplifierQ[a + b*x, c + d*x] && SimplifierQ[a + b*x, e + f*x]
```

Rule 119

```
Int[1/(Sqrt[(a_) + (b_)*(x_)]*Sqrt[(c_) + (d_)*(x_)]*Sqrt[(e_) + (f_)*(x_)]), x_Symbol] :> Dist[Sqrt[(b*(c + d*x))/(b*c - a*d)]/Sqrt[c + d*x], Int[1/(Sqrt[a + b*x]*Sqrt[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)]*Sqrt[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && !GtQ[(b*c - a*d)/b, 0] && SimplifierQ[a + b*x, c + d*x] && SimplifierQ[a + b*x, e + f*x]
```



```

_)]), x_Symbol] := Simp[(2*Rt[-(b/d), 2]*EllipticF[ArcSin[Sqrt[a + b*x]/(Rt
[-(b/d), 2]*Sqrt[(b*c - a*d)/b]]], (f*(b*c - a*d))/(d*(b*e - a*f)))]/(b*Sqr
t[(b*e - a*f)/b]), x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[(b*c - a*d)/b,
0] && GtQ[(b*e - a*f)/b, 0] && PosQ[-(b/d)] && !(SimplerQ[c + d*x, a + b*
x] && GtQ[(d*e - c*f)/d, 0] && GtQ[-(d/b), 0]) && !(SimplerQ[c + d*x, a +
b*x] && GtQ[(-(b*e) + a*f)/f, 0] && GtQ[-(f/b), 0]) && !(SimplerQ[e + f*x,
a + b*x] && GtQ[(-(d*e) + c*f)/f, 0] && GtQ[(-(b*e) + a*f)/f, 0] && (PosQ[
-(f/d)] || PosQ[-(f/b)]))

```

Rubi steps

$$\begin{aligned}
\int \frac{\sqrt{2-3x}}{\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^3} dx &= -\frac{5\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{1794(7+5x)^2} - \frac{\int \frac{-1063+1372x-120x^2}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^2} dx}{3588} \\
&= -\frac{5\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{1794(7+5x)^2} - \frac{26825\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{33257172(7+5x)} - \frac{\int \frac{-7905051+407}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^2} dx}{1995} \\
&= -\frac{5\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{1794(7+5x)^2} - \frac{26825\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{33257172(7+5x)} - \frac{\int \frac{\frac{1369224}{5}+386}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^2} dx}{1995430} \\
&= -\frac{5\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{1794(7+5x)^2} - \frac{26825\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{33257172(7+5x)} - \frac{5365 \int \frac{\sqrt{-5+2x}\sqrt{1+4x}}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^2} dx}{554286} \\
&= -\frac{5\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{1794(7+5x)^2} - \frac{26825\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{33257172(7+5x)} - \frac{(5456647\sqrt{\frac{3}{11}})}{1995430} \\
&= -\frac{5\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{1794(7+5x)^2} - \frac{26825\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{33257172(7+5x)} + \frac{5365\sqrt{11}\sqrt{-5+2x}\sqrt{1+4x}}{1995430}
\end{aligned}$$

Mathematica [A] time = 0.420694, size = 144, normalized size = 0.64

$$\frac{-\sqrt{55-22x}(5x+7)^2 \left(-64043148 \operatorname{EllipticF} \left(\sin^{-1} \left(\frac{2\sqrt{2-3x}}{\sqrt{11}} \right), -\frac{1}{2} \right) + 36589300E \left(\sin^{-1} \left(\frac{2\sqrt{2-3x}}{\sqrt{11}} \right) \middle| -\frac{1}{2} \right) - 49109823\pi \left(\frac{5}{11} \right) \right)}{113406956520\sqrt{2x-5}(5x+7)^2}$$

Antiderivative was successfully verified.

[In] Integrate[Sqrt[2 - 3*x]/(Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(7 + 5*x)^3), x]

```
[Out] (-17050*Sqrt[2 - 3*x]*(-5 + 2*x)*Sqrt[1 + 4*x]*(56093 + 26825*x) - Sqrt[55
- 22*x]*(7 + 5*x)^2*(36589300*EllipticE[ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]],
-1/2] - 64043148*EllipticF[ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2] - 491
09823*EllipticPi[55/124, -ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2]))/(1134
06956520*Sqrt[-5 + 2*x]*(7 + 5*x)^2)
```

Maple [B] time = 0.018, size = 461, normalized size = 2.1

$$\frac{1}{(2721766956480x^3 - 7938486956400x^2 + 2381546086920x + 1134069565200)(7 + 5x)^2 \sqrt{2 - 3x} \sqrt{2x - 5} \sqrt{4x + 1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((2-3*x)^(1/2)/(7+5*x)^3/(2*x-5)^(1/2)/(4*x+1)^(1/2), x)
```

```
[Out] -1/113406956520*(2-3*x)^(1/2)*(2*x-5)^(1/2)*(4*x+1)^(1/2)*(1601078700*11^(1
/2)*(2-3*x)^(1/2)*(5-2*x)^(1/2)*(4*x+1)^(1/2)*EllipticF(2/11*(22-33*x)^(1/2
), 1/2*I*2^(1/2))*x^2-914732500*11^(1/2)*(2-3*x)^(1/2)*(5-2*x)^(1/2)*(4*x+1
)^(1/2)*EllipticE(2/11*(22-33*x)^(1/2), 1/2*I*2^(1/2))*x^2-1227745575*11^(1/2
)*(2-3*x)^(1/2)*(5-2*x)^(1/2)*(4*x+1)^(1/2)*EllipticPi(2/11*(22-33*x)^(1/2
), 55/124, 1/2*I*2^(1/2))*x^2+4483020360*11^(1/2)*(2-3*x)^(1/2)*(5-2*x)^(1/2)*
(4*x+1)^(1/2)*EllipticF(2/11*(22-33*x)^(1/2), 1/2*I*2^(1/2))*x-2561251000*11
^(1/2)*(2-3*x)^(1/2)*(5-2*x)^(1/2)*(4*x+1)^(1/2)*EllipticE(2/11*(22-33*x)^(
1/2), 1/2*I*2^(1/2))*x-3437687610*11^(1/2)*(2-3*x)^(1/2)*(5-2*x)^(1/2)*(4*x+
1)^(1/2)*EllipticPi(2/11*(22-33*x)^(1/2), 55/124, 1/2*I*2^(1/2))*x+3138114252
*11^(1/2)*(2-3*x)^(1/2)*(5-2*x)^(1/2)*(4*x+1)^(1/2)*EllipticF(2/11*(22-33*x
)^(1/2), 1/2*I*2^(1/2))-1792875700*11^(1/2)*(2-3*x)^(1/2)*(5-2*x)^(1/2)*(4*x
+1)^(1/2)*EllipticE(2/11*(22-33*x)^(1/2), 1/2*I*2^(1/2))-2406381327*11^(1/2
)*(2-3*x)^(1/2)*(5-2*x)^(1/2)*(4*x+1)^(1/2)*EllipticPi(2/11*(22-33*x)^(1/2),
55/124, 1/2*I*2^(1/2))+10976790000*x^4-9062381900*x^3-57342304250*x^2+246577
61150*x+9563856500)/(24*x^3-70*x^2+21*x+10)/(7+5*x)^2
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{-3x+2}}{(5x+7)^3 \sqrt{4x+1} \sqrt{2x-5}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2-3*x)^(1/2)/(7+5*x)^3/(-5+2*x)^(1/2)/(1+4*x)^(1/2),x, algorithm="maxima")

[Out] integrate(sqrt(-3*x + 2)/((5*x + 7)^3*sqrt(4*x + 1)*sqrt(2*x - 5)), x)

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2}}{1000x^5+1950x^4-4195x^3-13111x^2-9849x-1715}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2-3*x)^(1/2)/(7+5*x)^3/(-5+2*x)^(1/2)/(1+4*x)^(1/2),x, algorithm="fricas")

[Out] integral(sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)/(1000*x^5 + 1950*x^4 - 4195*x^3 - 13111*x^2 - 9849*x - 1715), x)

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2-3*x)**(1/2)/(7+5*x)**3/(-5+2*x)**(1/2)/(1+4*x)**(1/2),x)

[Out] Timed out

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{-3x+2}}{(5x+7)^3\sqrt{4x+1}\sqrt{2x-5}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2-3*x)^(1/2)/(7+5*x)^3/(-5+2*x)^(1/2)/(1+4*x)^(1/2),x, algorithm="giac")

```
[Out] integrate(sqrt(-3*x + 2)/((5*x + 7)^3*sqrt(4*x + 1)*sqrt(2*x - 5)), x)
```

$$3.58 \quad \int \frac{\sqrt{c+dx}}{(a+bx)\sqrt{e+fx}\sqrt{g+hx}} dx$$

Optimal. Leaf size=293

$$\frac{2\sqrt{cf-de}\sqrt{\frac{d(e+fx)}{de-cf}}\sqrt{\frac{d(g+hx)}{dg-ch}}\text{EllipticF}\left(\sin^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{cf-de}}\right),\frac{h(de-cf)}{f(dg-ch)}\right)}{b\sqrt{f}\sqrt{e+fx}\sqrt{g+hx}} - \frac{2\sqrt{cf-de}\sqrt{\frac{d(e+fx)}{de-cf}}\sqrt{\frac{d(g+hx)}{dg-ch}}\Pi\left(-\frac{b(de-cf)}{(bc-ad)f};\sin^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{cf-de}}\right)\right)}{b\sqrt{f}\sqrt{e+fx}\sqrt{g+hx}}$$

[Out] (2*Sqrt[-(d*e) + c*f]*Sqrt[(d*(e + f*x))/(d*e - c*f)]*Sqrt[(d*(g + h*x))/(d*g - c*h)]*EllipticF[ArcSin[(Sqrt[f]*Sqrt[c + d*x])/Sqrt[-(d*e) + c*f]], ((d*e - c*f)*h)/(f*(d*g - c*h)))]/(b*Sqrt[f]*Sqrt[e + f*x]*Sqrt[g + h*x]) - (2*Sqrt[-(d*e) + c*f]*Sqrt[(d*(e + f*x))/(d*e - c*f)]*Sqrt[(d*(g + h*x))/(d*g - c*h)]*EllipticPi[-((b*(d*e - c*f))/((b*c - a*d)*f)), ArcSin[(Sqrt[f]*Sqrt[c + d*x])/Sqrt[-(d*e) + c*f]], ((d*e - c*f)*h)/(f*(d*g - c*h)))]/(b*Sqrt[f]*Sqrt[e + f*x]*Sqrt[g + h*x])

Rubi [A] time = 0.504431, antiderivative size = 293, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 6, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}} = 0.171$, Rules used = {175, 121, 120, 169, 538, 537}

$$\frac{2\sqrt{cf-de}\sqrt{\frac{d(e+fx)}{de-cf}}\sqrt{\frac{d(g+hx)}{dg-ch}}F\left(\sin^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{cf-de}}\right)\middle|\frac{(de-cf)h}{f(dg-ch)}\right)}{b\sqrt{f}\sqrt{e+fx}\sqrt{g+hx}} - \frac{2\sqrt{cf-de}\sqrt{\frac{d(e+fx)}{de-cf}}\sqrt{\frac{d(g+hx)}{dg-ch}}\Pi\left(-\frac{b(de-cf)}{(bc-ad)f};\sin^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{cf-de}}\right)\right)}{b\sqrt{f}\sqrt{e+fx}\sqrt{g+hx}}$$

Antiderivative was successfully verified.

[In] Int[Sqrt[c + d*x]/((a + b*x)*Sqrt[e + f*x]*Sqrt[g + h*x]), x]

[Out] (2*Sqrt[-(d*e) + c*f]*Sqrt[(d*(e + f*x))/(d*e - c*f)]*Sqrt[(d*(g + h*x))/(d*g - c*h)]*EllipticF[ArcSin[(Sqrt[f]*Sqrt[c + d*x])/Sqrt[-(d*e) + c*f]], ((d*e - c*f)*h)/(f*(d*g - c*h)))]/(b*Sqrt[f]*Sqrt[e + f*x]*Sqrt[g + h*x]) - (2*Sqrt[-(d*e) + c*f]*Sqrt[(d*(e + f*x))/(d*e - c*f)]*Sqrt[(d*(g + h*x))/(d*g - c*h)]*EllipticPi[-((b*(d*e - c*f))/((b*c - a*d)*f)), ArcSin[(Sqrt[f]*Sqrt[c + d*x])/Sqrt[-(d*e) + c*f]], ((d*e - c*f)*h)/(f*(d*g - c*h)))]/(b*Sqrt[f]*Sqrt[e + f*x]*Sqrt[g + h*x])

Rule 175

Int[Sqrt[(c_.) + (d_.)*(x_.)]/(((a_.) + (b_.)*(x_.))*Sqrt[(e_.) + (f_.)*(x_.)]*Sqrt[(g_.) + (h_.)*(x_.)]), x_Symbol] := Dist[d/b, Int[1/(Sqrt[c + d*x]*Sqr

$\text{t}[e + f*x]*\text{Sqrt}[g + h*x], x], x] + \text{Dist}[(b*c - a*d)/b, \text{Int}[1/((a + b*x)*\text{Sqrt}[c + d*x]*\text{Sqrt}[e + f*x]*\text{Sqrt}[g + h*x]), x], x] /; \text{FreeQ}\{a, b, c, d, e, f, g, h\}, x]$

Rule 121

$\text{Int}[1/(\text{Sqrt}[(a_) + (b_)*(x_)]*\text{Sqrt}[(c_) + (d_)*(x_)]*\text{Sqrt}[(e_) + (f_)*(x_)]), x_Symbol] :> \text{Dist}[\text{Sqrt}[(b*(c + d*x))/(b*c - a*d)]/\text{Sqrt}[c + d*x], \text{Int}[1/(\text{Sqrt}[a + b*x]*\text{Sqrt}[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)]*\text{Sqrt}[e + f*x]), x], x] /; \text{FreeQ}\{a, b, c, d, e, f\}, x] \&\& !\text{GtQ}[(b*c - a*d)/b, 0] \&\& \text{SimplerQ}[a + b*x, c + d*x] \&\& \text{SimplerQ}[a + b*x, e + f*x]$

Rule 120

$\text{Int}[1/(\text{Sqrt}[(a_) + (b_)*(x_)]*\text{Sqrt}[(c_) + (d_)*(x_)]*\text{Sqrt}[(e_) + (f_)*(x_)]), x_Symbol] :> \text{Simp}[(2*\text{Rt}[-(b/d), 2]*\text{EllipticF}[\text{ArcSin}[\text{Sqrt}[a + b*x]/\text{Rt}[-(b/d), 2]*\text{Sqrt}[(b*c - a*d)/b]], (f*(b*c - a*d))/(d*(b*e - a*f)))]/(b*\text{Sqrt}[(b*e - a*f)/b]), x] /; \text{FreeQ}\{a, b, c, d, e, f\}, x] \&\& \text{GtQ}[b/(b*c - a*d), 0] \&\& \text{GtQ}[b/(b*e - a*f), 0] \&\& \text{SimplerQ}[a + b*x, c + d*x] \&\& \text{SimplerQ}[a + b*x, e + f*x] \&\& (\text{PosQ}[-(b*c - a*d)/d] || \text{NegQ}[-(b*e - a*f)/f])]$

Rule 169

$\text{Int}[1/(((a_) + (b_)*(x_))*\text{Sqrt}[(c_) + (d_)*(x_)]*\text{Sqrt}[(e_) + (f_)*(x_)]*\text{Sqrt}[(g_) + (h_)*(x_)]), x_Symbol] :> \text{Dist}[-2, \text{Subst}[\text{Int}[1/(\text{Simp}[b*c - a*d - b*x^2, x]*\text{Sqrt}[\text{Simp}[(d*e - c*f)/d + (f*x^2)/d, x]]*\text{Sqrt}[\text{Simp}[(d*g - c*h)/d + (h*x^2)/d, x]]), x], x, \text{Sqrt}[c + d*x]], x] /; \text{FreeQ}\{a, b, c, d, e, f, g, h\}, x] \&\& !\text{SimplerQ}[e + f*x, c + d*x] \&\& !\text{SimplerQ}[g + h*x, c + d*x]$

Rule 538

$\text{Int}[1/(((a_) + (b_)*(x_)^2)*\text{Sqrt}[(c_) + (d_)*(x_)^2]*\text{Sqrt}[(e_) + (f_)*(x_)^2]), x_Symbol] :> \text{Dist}[\text{Sqrt}[1 + (d*x^2)/c]/\text{Sqrt}[c + d*x^2], \text{Int}[1/((a + b*x^2)*\text{Sqrt}[1 + (d*x^2)/c]*\text{Sqrt}[e + f*x^2]), x], x] /; \text{FreeQ}\{a, b, c, d, e, f\}, x] \&\& !\text{GtQ}[c, 0]$

Rule 537

$\text{Int}[1/(((a_) + (b_)*(x_)^2)*\text{Sqrt}[(c_) + (d_)*(x_)^2]*\text{Sqrt}[(e_) + (f_)*(x_)^2]), x_Symbol] :> \text{Simp}[(1*\text{EllipticPi}[(b*c)/(a*d), \text{ArcSin}[\text{Rt}[-(d/c), 2]*x], (c*f)/(d*e))]/(a*\text{Sqrt}[c]*\text{Sqrt}[e]*\text{Rt}[-(d/c), 2]), x] /; \text{FreeQ}\{a, b, c, d, e, f\}, x] \&\& !\text{GtQ}[d/c, 0] \&\& \text{GtQ}[c, 0] \&\& \text{GtQ}[e, 0] \&\& !(!\text{GtQ}[f/e, 0] \&\& \text{SimplerSqrtQ}[-(f/e), -(d/c)])]$

Rubi steps

$$\begin{aligned}
\int \frac{\sqrt{c+dx}}{(a+bx)\sqrt{e+fx}\sqrt{g+hx}} dx &= \frac{d \int \frac{1}{\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}} dx}{b} + \frac{(bc-ad) \int \frac{1}{(a+bx)\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}} dx}{b} \\
&= -\frac{(2(bc-ad)) \operatorname{Subst} \left(\int \frac{1}{(bc-ad-bx^2)\sqrt{e-\frac{cf}{d}+\frac{fx^2}{d}}\sqrt{g-\frac{ch}{d}+\frac{hx^2}{d}}} dx, x, \sqrt{c+dx} \right)}{b} + \frac{\left(d\sqrt{\frac{d(e+fx)}{de-cf}} \right)}{b} \\
&= -\frac{\left(2(bc-ad)\sqrt{\frac{d(e+fx)}{de-cf}} \right) \operatorname{Subst} \left(\int \frac{1}{(bc-ad-bx^2)\sqrt{1+\frac{fx^2}{d\left(e-\frac{cf}{d}\right)}}\sqrt{g-\frac{ch}{d}+\frac{hx^2}{d}}} dx, x, \sqrt{c+dx} \right)}{b\sqrt{e+fx}} + \frac{\left(d\sqrt{\frac{d(e+fx)}{de-cf}} \right)}{b\sqrt{e+fx}} \\
&= \frac{2\sqrt{-de+cf}\sqrt{\frac{d(e+fx)}{de-cf}}\sqrt{\frac{d(g+hx)}{dg-ch}} F\left(\sin^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{-de+cf}}\right) \middle| \frac{(de-cf)h}{f(dg-ch)}\right)}{b\sqrt{f}\sqrt{e+fx}\sqrt{g+hx}} - \frac{\left(2(bc-ad)\sqrt{\frac{d(e+fx)}{de-cf}}\sqrt{\frac{d(g+hx)}{dg-ch}} \right)}{b\sqrt{f}\sqrt{e+fx}\sqrt{g+hx}} \\
&= \frac{2\sqrt{-de+cf}\sqrt{\frac{d(e+fx)}{de-cf}}\sqrt{\frac{d(g+hx)}{dg-ch}} F\left(\sin^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{-de+cf}}\right) \middle| \frac{(de-cf)h}{f(dg-ch)}\right)}{b\sqrt{f}\sqrt{e+fx}\sqrt{g+hx}} - \frac{2\sqrt{-de+cf}\sqrt{\frac{d(e+fx)}{de-cf}}\sqrt{\frac{d(g+hx)}{dg-ch}}}{b\sqrt{f}\sqrt{e+fx}\sqrt{g+hx}}
\end{aligned}$$

Mathematica [C] time = 1.71334, size = 202, normalized size = 0.69

$$\frac{2i\sqrt{c+dx}\sqrt{\frac{d(g+hx)}{dg-ch}} \left(\operatorname{EllipticF} \left(i \sinh^{-1} \left(\sqrt{\frac{f(c+dx)}{de-cf}} \right), \frac{deh-cfh}{dfg-cfh} \right) - \Pi \left(\frac{b(cf-de)}{(bc-ad)f}; i \sinh^{-1} \left(\sqrt{\frac{f(c+dx)}{de-cf}} \right) \middle| \frac{deh-cfh}{dfg-cfh} \right) \right)}{b\sqrt{e+fx}\sqrt{g+hx}\sqrt{\frac{f(c+dx)}{d(e+fx)}}}$$

Antiderivative was successfully verified.

[In] Integrate[Sqrt[c + d*x]/((a + b*x)*Sqrt[e + f*x]*Sqrt[g + h*x]), x]

[Out] ((-2*I)*Sqrt[c + d*x]*Sqrt[(d*(g + h*x))/(d*g - c*h)]*(EllipticF[I*ArcSinh[Sqrt[(f*(c + d*x))/(d*e - c*f)]]], (d*e*h - c*f*h)/(d*f*g - c*f*h)] - EllipticPi[(b*(-(d*e) + c*f))/((b*c - a*d)*f), I*ArcSinh[Sqrt[(f*(c + d*x))/(d*e - c*f)]]], (d*e*h - c*f*h)/(d*f*g - c*f*h)))/(b*Sqrt[(f*(c + d*x))/(d*(e +

f*x)))*Sqrt[e + f*x]*Sqrt[g + h*x])

Maple [A] time = 0.043, size = 382, normalized size = 1.3

$$2 \frac{\sqrt{dx+c}\sqrt{fx+e}\sqrt{hx+g}}{fb(dfhx^3 + cfhx^2 + deh x^2 + dfgx^2 + celx + cfgx + degx + ceg)} \sqrt{\frac{f(dx+c)}{cf-de}} \sqrt{-\frac{(hx+g)d}{ch-dg}} \sqrt{-\frac{(fx+e)d}{cf-de}} \left(\text{EllipticF} \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((d*x+c)^(1/2)/(b*x+a)/(f*x+e)^(1/2)/(h*x+g)^(1/2), x)

[Out] 2*(d*x+c)^(1/2)*(f*x+e)^(1/2)*(h*x+g)^(1/2)/f/b*((d*x+c)*f/(c*f-d*e))^(1/2)*(-h*x+g)*d/(c*h-d*g))^(1/2)*(-f*x+e)*d/(c*f-d*e))^(1/2)*(EllipticF(((d*x+c)*f/(c*f-d*e))^(1/2), ((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*c*f-EllipticF(((d*x+c)*f/(c*f-d*e))^(1/2), ((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*d*e-EllipticPi(((d*x+c)*f/(c*f-d*e))^(1/2), -(c*f-d*e)*b/f/(a*d-b*c), ((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*c*f+EllipticPi(((d*x+c)*f/(c*f-d*e))^(1/2), -(c*f-d*e)*b/f/(a*d-b*c), ((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*d*e)/(d*f*h*x^3+c*f*h*x^2+d*e*h*x^2+d*f*g*x^2+c*e*h*x+c*f*g*x+d*e*g*x+c*e*g)

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{dx+c}}{(bx+a)\sqrt{fx+e}\sqrt{hx+g}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d*x+c)^(1/2)/(b*x+a)/(f*x+e)^(1/2)/(h*x+g)^(1/2), x, algorithm="maxima")

[Out] integrate(sqrt(d*x + c)/((b*x + a)*sqrt(f*x + e)*sqrt(h*x + g)), x)

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.


```
[In] integrate((d*x+c)^(1/2)/(b*x+a)/(f*x+e)^(1/2)/(h*x+g)^(1/2),x, algorithm="f
ricas")
```

```
[Out] Timed out
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{c+dx}}{(a+bx)\sqrt{e+fx}\sqrt{g+hx}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*x+c)**(1/2)/(b*x+a)/(f*x+e)**(1/2)/(h*x+g)**(1/2),x)
```

```
[Out] Integral(sqrt(c + d*x)/((a + b*x)*sqrt(e + f*x)*sqrt(g + h*x)), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{dx+c}}{(bx+a)\sqrt{fx+e}\sqrt{hx+g}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*x+c)^(1/2)/(b*x+a)/(f*x+e)^(1/2)/(h*x+g)^(1/2),x, algorithm="g
iac")
```

```
[Out] integrate(sqrt(d*x + c)/((b*x + a)*sqrt(f*x + e)*sqrt(h*x + g)), x)
```

$$3.59 \quad \int \frac{(c+dx)^{3/2}}{(a+bx)\sqrt{e+fx}\sqrt{g+hx}} dx$$

Optimal. Leaf size=449

$$\frac{2(bc-ad)\sqrt{cf-de}\sqrt{\frac{d(e+fx)}{de-cf}}\sqrt{\frac{d(g+hx)}{dg-ch}}\text{EllipticF}\left(\sin^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{cf-de}}\right),\frac{h(de-cf)}{f(dg-ch)}\right)}{b^2\sqrt{f}\sqrt{e+fx}\sqrt{g+hx}} - \frac{2(bc-ad)\sqrt{cf-de}\sqrt{\frac{d(e+fx)}{de-cf}}\sqrt{\frac{d(g+hx)}{dg-ch}}\Pi\left(-\frac{b(de-cf)}{(bc-ad)f}\right)}{b^2\sqrt{f}\sqrt{e+fx}\sqrt{g+hx}}$$

[Out] (2*d*Sqrt[-(f*g) + e*h]*Sqrt[c + d*x]*Sqrt[(f*(g + h*x))/(f*g - e*h)]*EllipticE[ArcSin[(Sqrt[h]*Sqrt[e + f*x])/Sqrt[-(f*g) + e*h]], -((d*(f*g - e*h))/((d*e - c*f)*h))]/(b*f*Sqrt[h]*Sqrt[-((f*(c + d*x))/(d*e - c*f))]*Sqrt[g + h*x]) + (2*(b*c - a*d)*Sqrt[-(d*e) + c*f]*Sqrt[(d*(e + f*x))/(d*e - c*f)]*Sqrt[(d*(g + h*x))/(d*g - c*h)]*EllipticF[ArcSin[(Sqrt[f]*Sqrt[c + d*x])/Sqrt[-(d*e) + c*f]], ((d*e - c*f)*h)/(f*(d*g - c*h))]/(b^2*Sqrt[f]*Sqrt[e + f*x]*Sqrt[g + h*x]) - (2*(b*c - a*d)*Sqrt[-(d*e) + c*f]*Sqrt[(d*(e + f*x))/(d*e - c*f)]*Sqrt[(d*(g + h*x))/(d*g - c*h)]*EllipticPi[-((b*(d*e - c*f))/(b*c - a*d)*f), ArcSin[(Sqrt[f]*Sqrt[c + d*x])/Sqrt[-(d*e) + c*f]], ((d*e - c*f)*h)/(f*(d*g - c*h))]/(b^2*Sqrt[f]*Sqrt[e + f*x]*Sqrt[g + h*x])

Rubi [A] time = 0.671968, antiderivative size = 449, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 8, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}} = 0.229$, Rules used = {179, 121, 120, 169, 538, 537, 114, 113}

$$\frac{2(bc-ad)\sqrt{cf-de}\sqrt{\frac{d(e+fx)}{de-cf}}\sqrt{\frac{d(g+hx)}{dg-ch}}F\left(\sin^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{cf-de}}\right)\middle|\frac{(de-cf)h}{f(dg-ch)}\right)}{b^2\sqrt{f}\sqrt{e+fx}\sqrt{g+hx}} - \frac{2(bc-ad)\sqrt{cf-de}\sqrt{\frac{d(e+fx)}{de-cf}}\sqrt{\frac{d(g+hx)}{dg-ch}}\Pi\left(-\frac{b(de-cf)}{(bc-ad)f}\right)}{b^2\sqrt{f}\sqrt{e+fx}\sqrt{g+hx}}$$

Antiderivative was successfully verified.

[In] Int[(c + d*x)^(3/2)/((a + b*x)*Sqrt[e + f*x]*Sqrt[g + h*x]),x]

[Out] (2*d*Sqrt[-(f*g) + e*h]*Sqrt[c + d*x]*Sqrt[(f*(g + h*x))/(f*g - e*h)]*EllipticE[ArcSin[(Sqrt[h]*Sqrt[e + f*x])/Sqrt[-(f*g) + e*h]], -((d*(f*g - e*h))/((d*e - c*f)*h))]/(b*f*Sqrt[h]*Sqrt[-((f*(c + d*x))/(d*e - c*f))]*Sqrt[g + h*x]) + (2*(b*c - a*d)*Sqrt[-(d*e) + c*f]*Sqrt[(d*(e + f*x))/(d*e - c*f)]*Sqrt[(d*(g + h*x))/(d*g - c*h)]*EllipticF[ArcSin[(Sqrt[f]*Sqrt[c + d*x])/Sqrt[-(d*e) + c*f]], ((d*e - c*f)*h)/(f*(d*g - c*h))]/(b^2*Sqrt[f]*Sqrt[e + f*x]*Sqrt[g + h*x]) - (2*(b*c - a*d)*Sqrt[-(d*e) + c*f]*Sqrt[(d*(e + f*x))/

$$\frac{(d*e - c*f)*\text{Sqrt}[d*(g + h*x)]/(d*g - c*h)*\text{EllipticPi}[-((b*(d*e - c*f))/(b*c - a*d)*f)], \text{ArcSin}[\frac{\text{Sqrt}[f]*\text{Sqrt}[c + d*x]}{\text{Sqrt}[-(d*e) + c*f]}], ((d*e - c*f)*h)/(f*(d*g - c*h))]/(b^2*\text{Sqrt}[f]*\text{Sqrt}[e + f*x]*\text{Sqrt}[g + h*x])$$

Rule 179

```
Int[(((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_))/(Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Int[ExpandIntegrand[1/(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]), (a + b*x)^m*(c + d*x)^(n + 1/2), x], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x] && IntegerQ[m] && IntegerQ[n + 1/2]
```

Rule 121

```
Int[1/(Sqrt[(a_) + (b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x_)]), x_Symbol] := Dist[Sqrt[(b*(c + d*x))/(b*c - a*d)]/Sqrt[c + d*x], Int[1/(Sqrt[a + b*x]*Sqrt[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)]*Sqrt[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && !GtQ[(b*c - a*d)/b, 0] && SimplerQ[a + b*x, c + d*x] && SimplerQ[a + b*x, e + f*x]
```

Rule 120

```
Int[1/(Sqrt[(a_) + (b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x_)]), x_Symbol] := Simp[(2*Rt[-(b/d), 2]*EllipticF[ArcSin[Sqrt[a + b*x]]/(Rt[-(b/d), 2]*Sqrt[(b*c - a*d)/b])], (f*(b*c - a*d))/(d*(b*e - a*f))]/(b*Sqrt[(b*e - a*f)/b]), x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[b/(b*c - a*d), 0] && GtQ[b/(b*e - a*f), 0] && SimplerQ[a + b*x, c + d*x] && SimplerQ[a + b*x, e + f*x] && (PosQ[-((b*c - a*d)/d)] || NegQ[-((b*e - a*f)/f)])
```

Rule 169

```
Int[1/(((a_.) + (b_.)*(x_))*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Dist[-2, Subst[Int[1/(Simp[b*c - a*d - b*x^2, x]*Sqrt[Simp[(d*e - c*f)/d + (f*x^2)/d, x]]*Sqrt[Simp[(d*g - c*h)/d + (h*x^2)/d, x]]), x], x, Sqrt[c + d*x]], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x] && !SimplerQ[e + f*x, c + d*x] && !SimplerQ[g + h*x, c + d*x]
```

Rule 538

```
Int[1/(((a_) + (b_.)*(x_)^2)*Sqrt[(c_) + (d_.)*(x_)^2]*Sqrt[(e_) + (f_.)*(x_)^2]), x_Symbol] := Dist[Sqrt[1 + (d*x^2)/c]/Sqrt[c + d*x^2], Int[1/((a + b*x^2)*Sqrt[1 + (d*x^2)/c]*Sqrt[e + f*x^2]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && !GtQ[c, 0]
```

Rule 537

```
Int[1/(((a_) + (b_)*(x_)^2)*Sqrt[(c_) + (d_)*(x_)^2]*Sqrt[(e_) + (f_)*(x_)^2]), x_Symbol] :> Simp[(1*EllipticPi[(b*c)/(a*d), ArcSin[Rt[-(d/c), 2]*x], (c*f)/(d*e)])/(a*Sqrt[c]*Sqrt[e]*Rt[-(d/c), 2]), x] /; FreeQ[{a, b, c, d, e, f}, x] && !GtQ[d/c, 0] && GtQ[c, 0] && GtQ[e, 0] && !( !GtQ[f/e, 0] && SimplerSqrtQ[-(f/e), -(d/c)])
```

Rule 114

```
Int[Sqrt[(e_) + (f_)*(x_)]/(Sqrt[(a_) + (b_)*(x_)]*Sqrt[(c_) + (d_)*(x_)]), x_Symbol] :> Dist[(Sqrt[e + f*x]*Sqrt[(b*(c + d*x))/(b*c - a*d)])/(Sqrt[c + d*x]*Sqrt[(b*(e + f*x))/(b*e - a*f)]), Int[Sqrt[(b*e)/(b*e - a*f) + (b*f*x)/(b*e - a*f)]/(Sqrt[a + b*x]*Sqrt[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && !(GtQ[b/(b*c - a*d), 0] && GtQ[b/(b*e - a*f), 0]) && !LtQ[-((b*c - a*d)/d), 0]
```

Rule 113

```
Int[Sqrt[(e_) + (f_)*(x_)]/(Sqrt[(a_) + (b_)*(x_)]*Sqrt[(c_) + (d_)*(x_)]), x_Symbol] :> Simp[(2*Rt[-((b*e - a*f)/d), 2]*EllipticE[ArcSin[Sqrt[a + b*x]/Rt[-((b*c - a*d)/d), 2]], (f*(b*c - a*d))/(d*(b*e - a*f))]/b, x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[b/(b*c - a*d), 0] && GtQ[b/(b*e - a*f), 0] && !LtQ[-((b*c - a*d)/d), 0] && !(SimplerQ[c + d*x, a + b*x] && GtQ[-(d/(b*c - a*d)), 0] && GtQ[d/(d*e - c*f), 0] && !LtQ[(b*c - a*d)/b, 0])
```

Rubi steps

$$\begin{aligned}
\int \frac{(c+dx)^{3/2}}{(a+bx)\sqrt{e+fx}\sqrt{g+hx}} dx &= \int \left(\frac{d(bc-ad)}{b^2\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}} + \frac{(bc-ad)^2}{b^2(a+bx)\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}} + \frac{d\sqrt{c+dx}}{b\sqrt{e+fx}\sqrt{g+hx}} \right) dx \\
&= \frac{d \int \frac{\sqrt{c+dx}}{\sqrt{e+fx}\sqrt{g+hx}} dx}{b} + \frac{(d(bc-ad)) \int \frac{1}{\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}} dx}{b^2} + \frac{(bc-ad)^2 \int \frac{1}{(a+bx)\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}} dx}{b^2} \\
&= -\frac{(2(bc-ad)^2) \text{Subst} \left(\int \frac{1}{(bc-ad-bx^2)\sqrt{e-\frac{cf}{d}+\frac{fx^2}{d}}\sqrt{g-\frac{ch}{d}+\frac{hx^2}{d}}} dx, x, \sqrt{c+dx} \right)}{b^2} + \frac{(d(bc-ad)) \int \frac{\sqrt{c+dx}}{\sqrt{e+fx}\sqrt{g+hx}} dx}{b} \\
&= \frac{2d\sqrt{-fg+eh}\sqrt{c+dx}\sqrt{\frac{f(g+hx)}{fg-eh}} E \left(\sin^{-1} \left(\frac{\sqrt{h}\sqrt{e+fx}}{\sqrt{-fg+eh}} \right) \middle| -\frac{d(fg-eh)}{(de-cf)h} \right)}{bf\sqrt{h}\sqrt{-\frac{f(c+dx)}{de-cf}}\sqrt{g+hx}} - \frac{(2(bc-ad)^2\sqrt{\frac{d(e+fx)}{de-cf}})}{b^2} \\
&= \frac{2d\sqrt{-fg+eh}\sqrt{c+dx}\sqrt{\frac{f(g+hx)}{fg-eh}} E \left(\sin^{-1} \left(\frac{\sqrt{h}\sqrt{e+fx}}{\sqrt{-fg+eh}} \right) \middle| -\frac{d(fg-eh)}{(de-cf)h} \right)}{bf\sqrt{h}\sqrt{-\frac{f(c+dx)}{de-cf}}\sqrt{g+hx}} + \frac{2(bc-ad)\sqrt{-de+ch}}{b^2} \\
&= \frac{2d\sqrt{-fg+eh}\sqrt{c+dx}\sqrt{\frac{f(g+hx)}{fg-eh}} E \left(\sin^{-1} \left(\frac{\sqrt{h}\sqrt{e+fx}}{\sqrt{-fg+eh}} \right) \middle| -\frac{d(fg-eh)}{(de-cf)h} \right)}{bf\sqrt{h}\sqrt{-\frac{f(c+dx)}{de-cf}}\sqrt{g+hx}} + \frac{2(bc-ad)\sqrt{-de+ch}}{b^2}
\end{aligned}$$

Mathematica [C] time = 8.34992, size = 1195, normalized size = 2.66

$$2 \left(b^2 d^2 \sqrt{\frac{fg}{h}} - e h e^3 - a b d^2 f \sqrt{\frac{fg}{h}} - e h e^2 - b^2 c d f \sqrt{\frac{fg}{h}} - e h e^2 - 2 b^2 d^2 \sqrt{\frac{fg}{h}} - e h (e + f x) e^2 - b^2 d^2 f g \sqrt{\frac{fg}{h}} - e e^2 + b^2 d^2 \sqrt{\frac{fg}{h}} \right)$$

Antiderivative was successfully verified.

[In] Integrate[(c + d*x)^(3/2)/((a + b*x)*Sqrt[e + f*x]*Sqrt[g + h*x]),x]

```
[Out] (-2*(-(b^2*d^2*e^2*f*g*Sqrt[-e + (f*g)/h]) + b^2*c*d*e*f^2*g*Sqrt[-e + (f*g)/h] + a*b*d^2*e*f^2*g*Sqrt[-e + (f*g)/h] - a*b*c*d*f^3*g*Sqrt[-e + (f*g)/h] + b^2*d^2*e^3*Sqrt[-e + (f*g)/h]*h - b^2*c*d*e^2*f*Sqrt[-e + (f*g)/h]*h - a*b*d^2*e^2*f*Sqrt[-e + (f*g)/h]*h + a*b*c*d*e*f^2*Sqrt[-e + (f*g)/h]*h + b^2*d^2*e*f*g*Sqrt[-e + (f*g)/h]*(e + f*x) - a*b*d^2*f^2*g*Sqrt[-e + (f*g)/h]*(e + f*x) - 2*b^2*d^2*e^2*Sqrt[-e + (f*g)/h]*h*(e + f*x) + b^2*c*d*e*f*Sqrt[-e + (f*g)/h]*h*(e + f*x) + 2*a*b*d^2*e*f*Sqrt[-e + (f*g)/h]*h*(e + f*x) - a*b*c*d*f^2*Sqrt[-e + (f*g)/h]*h*(e + f*x) + b^2*d^2*e*Sqrt[-e + (f*g)/h]*h*(e + f*x)^2 - a*b*d^2*f*Sqrt[-e + (f*g)/h]*h*(e + f*x)^2 + I*b*d^2*(b*e - a*f)*(f*g - e*h)*Sqrt[(f*(c + d*x))/(d*(e + f*x))]*(e + f*x)^(3/2)*Sqrt[(f*(g + h*x))/(h*(e + f*x))]*EllipticE[I*ArcSinh[Sqrt[-e + (f*g)/h]/Sqrt[e + f*x]], ((d*e - c*f)*h)/(d*(-(f*g) + e*h))] - I*b*f*(a*d^2*(-(f*g) + e*h) + b*(d^2*e*g - 2*c*d*e*h + c^2*f*h))*Sqrt[(f*(c + d*x))/(d*(e + f*x))]*(e + f*x)^(3/2)*Sqrt[(f*(g + h*x))/(h*(e + f*x))]*EllipticF[I*ArcSinh[Sqrt[-e + (f*g)/h]/Sqrt[e + f*x]], ((d*e - c*f)*h)/(d*(-(f*g) + e*h))] + I*b^2*c^2*f^2*h*Sqrt[(f*(c + d*x))/(d*(e + f*x))]*(e + f*x)^(3/2)*Sqrt[(f*(g + h*x))/(h*(e + f*x))]*EllipticPi[((b*e - a*f)*h)/(b*(-(f*g) + e*h)), I*ArcSinh[Sqrt[-e + (f*g)/h]/Sqrt[e + f*x]], ((d*e - c*f)*h)/(d*(-(f*g) + e*h))] - (2*I)*a*b*c*d*f^2*h*Sqrt[(f*(c + d*x))/(d*(e + f*x))]*(e + f*x)^(3/2)*Sqrt[(f*(g + h*x))/(h*(e + f*x))]*EllipticPi[((b*e - a*f)*h)/(b*(-(f*g) + e*h)), I*ArcSinh[Sqrt[-e + (f*g)/h]/Sqrt[e + f*x]], ((d*e - c*f)*h)/(d*(-(f*g) + e*h))] + I*a^2*d^2*f^2*h*Sqrt[(f*(c + d*x))/(d*(e + f*x))]*(e + f*x)^(3/2)*Sqrt[(f*(g + h*x))/(h*(e + f*x))]*EllipticPi[((b*e - a*f)*h)/(b*(-(f*g) + e*h)), I*ArcSinh[Sqrt[-e + (f*g)/h]/Sqrt[e + f*x]], ((d*e - c*f)*h)/(d*(-(f*g) + e*h)))])))/(b^2*f^2*(-(b*e) + a*f)*Sqrt[-e + (f*g)/h]*h*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])
```

Maple [B] time = 0.024, size = 968, normalized size = 2.2

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*x+c)^(3/2)/(b*x+a)/(f*x+e)^(1/2)/(h*x+g)^(1/2),x)
```

```
[Out] -2*(d*x+c)^(1/2)*(f*x+e)^(1/2)*(h*x+g)^(1/2)/f/h/b^2*((d*x+c)*f/(c*f-d*e))^(1/2)*(-(h*x+g)*d/(c*h-d*g))^(1/2)*(-(f*x+e)*d/(c*f-d*e))^(1/2)*EllipticF(((d*x+c)*f/(c*f-d*e))^(1/2),((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*a*c*d*f*h-EllipticF(((d*x+c)*f/(c*f-d*e))^(1/2),((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*a*d^2*e*h-2*EllipticF(((d*x+c)*f/(c*f-d*e))^(1/2),((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*b*c^2*f*h+2*EllipticF(((d*x+c)*f/(c*f-d*e))^(1/2),((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*b*c*d*e*h+EllipticF(((d*x+c)*f/(c*f-d*e))^(1/2),((c*f-d*e)*h/f/(c*h
```

$-d*g)^{(1/2)} * b*c*d*f*g - \text{EllipticF}(((d*x+c)*f/(c*f-d*e))^{(1/2)}, ((c*f-d*e)*h/f/(c*h-d*g))^{(1/2)}) * b*d^2*e*g + \text{EllipticE}(((d*x+c)*f/(c*f-d*e))^{(1/2)}, ((c*f-d*e)*h/f/(c*h-d*g))^{(1/2)}) * b*c^2*f*h - \text{EllipticE}(((d*x+c)*f/(c*f-d*e))^{(1/2)}, ((c*f-d*e)*h/f/(c*h-d*g))^{(1/2)}) * b*c*d*e*h - \text{EllipticE}(((d*x+c)*f/(c*f-d*e))^{(1/2)}, ((c*f-d*e)*h/f/(c*h-d*g))^{(1/2)}) * b*c*d*f*g + \text{EllipticE}(((d*x+c)*f/(c*f-d*e))^{(1/2)}, ((c*f-d*e)*h/f/(c*h-d*g))^{(1/2)}) * b*d^2*e*g - \text{EllipticPi}(((d*x+c)*f/(c*f-d*e))^{(1/2)}, -(c*f-d*e)*b/f/(a*d-b*c), ((c*f-d*e)*h/f/(c*h-d*g))^{(1/2)}) * a*c*d*f*h + \text{EllipticPi}(((d*x+c)*f/(c*f-d*e))^{(1/2)}, -(c*f-d*e)*b/f/(a*d-b*c), ((c*f-d*e)*h/f/(c*h-d*g))^{(1/2)}) * a*d^2*e*h + \text{EllipticPi}(((d*x+c)*f/(c*f-d*e))^{(1/2)}, -(c*f-d*e)*b/f/(a*d-b*c), ((c*f-d*e)*h/f/(c*h-d*g))^{(1/2)}) * b*c^2*f*h - \text{EllipticPi}(((d*x+c)*f/(c*f-d*e))^{(1/2)}, -(c*f-d*e)*b/f/(a*d-b*c), ((c*f-d*e)*h/f/(c*h-d*g))^{(1/2)}) * b*c*d*e*h) / (d*f*h*x^3 + c*f*h*x^2 + d*e*h*x^2 + d*f*g*x^2 + c*e*h*x + c*f*g*x + d*e*g*x + c*e*g)$

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dx + c)^{\frac{3}{2}}}{(bx + a)\sqrt{fx + e}\sqrt{hx + g}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d*x+c)^(3/2)/(b*x+a)/(f*x+e)^(1/2)/(h*x+g)^(1/2),x, algorithm="maxima")

[Out] integrate((d*x + c)^(3/2)/((b*x + a)*sqrt(f*x + e)*sqrt(h*x + g)), x)

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d*x+c)^(3/2)/(b*x+a)/(f*x+e)^(1/2)/(h*x+g)^(1/2),x, algorithm="fricas")

[Out] Timed out

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(c + dx)^{\frac{3}{2}}}{(a + bx)\sqrt{e + fx}\sqrt{g + hx}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d*x+c)**(3/2)/(b*x+a)/(f*x+e)**(1/2)/(h*x+g)**(1/2),x)

[Out] Integral((c + d*x)**(3/2)/((a + b*x)*sqrt(e + f*x)*sqrt(g + h*x)), x)

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dx + c)^{\frac{3}{2}}}{(bx + a)\sqrt{fx + e}\sqrt{hx + g}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d*x+c)^(3/2)/(b*x+a)/(f*x+e)^(1/2)/(h*x+g)^(1/2),x, algorithm="giac")

[Out] integrate((d*x + c)^(3/2)/((b*x + a)*sqrt(f*x + e)*sqrt(h*x + g)), x)

$$3.60 \quad \int \frac{(7+5x)^4}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}} dx$$

Optimal. Leaf size=203

$$\frac{392989907\sqrt{5-2x}\text{EllipticF}\left(\sin^{-1}\left(\sqrt{\frac{3}{11}}\sqrt{4x+1}\right), \frac{1}{3}\right)}{2016\sqrt{66}\sqrt{2x-5}} - \frac{25}{84}\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}(5x+7)^2 - \frac{305}{24}\sqrt{2-3x}\sqrt{2x-5}$$

```
[Out] (-120355*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/288 - (305*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(7 + 5*x))/24 - (25*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(7 + 5*x)^2)/84 - (5109835*Sqrt[11]*Sqrt[-5 + 2*x]*EllipticE[ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2])/(756*Sqrt[5 - 2*x]) + (392989907*Sqrt[5 - 2*x]*EllipticF[ArcSin[Sqrt[3/11]*Sqrt[1 + 4*x]], 1/3])/(2016*Sqrt[66]*Sqrt[-5 + 2*x])
```

Rubi [A] time = 0.215818, antiderivative size = 203, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 8, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}} = 0.229$, Rules used = {167, 1600, 1615, 158, 114, 113, 121, 119}

$$-\frac{25}{84}\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}(5x+7)^2 - \frac{305}{24}\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}(5x+7) - \frac{120355}{288}\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1} + \dots$$

Antiderivative was successfully verified.

```
[In] Int[(7 + 5*x)^4/(Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]), x]
```

```
[Out] (-120355*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/288 - (305*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(7 + 5*x))/24 - (25*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(7 + 5*x)^2)/84 - (5109835*Sqrt[11]*Sqrt[-5 + 2*x]*EllipticE[ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2])/(756*Sqrt[5 - 2*x]) + (392989907*Sqrt[5 - 2*x]*EllipticF[ArcSin[Sqrt[3/11]*Sqrt[1 + 4*x]], 1/3])/(2016*Sqrt[66]*Sqrt[-5 + 2*x])
```

Rule 167

```
Int[((a_.) + (b_.)*(x_))^(m_)/(Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] :> Simp[(2*b^2*(a + b*x)^(m - 2)*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(d*f*h*(2*m - 1)), x] - Dist[1/(d*f*h*(2*m - 1)), Int[((a + b*x)^(m - 3)/(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]))*Simp[a*b^2*(d*e*g + c*f*g + c*e*h) + 2*b^3*c*e*g*(m - 2) - a^3*
```

```
d*f*h*(2*m - 1) + b*(2*a*b*(d*f*g + d*e*h + c*f*h) + b^2*(2*m - 3)*(d*e*g +
c*f*g + c*e*h) - 3*a^2*d*f*h*(2*m - 1))*x - 2*b^2*(m - 1)*(3*a*d*f*h - b*(
d*f*g + d*e*h + c*f*h))*x^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, g, h},
x] && IntegerQ[2*m] && GeQ[m, 2]
```

Rule 1600

```
Int[(((a_.) + (b_.)*(x_))^(m_.)*((A_.) + (B_.)*(x_) + (C_.)*(x_)^2))/(Sqrt[
(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_S
ymbol] :> Simp[(2*C*(a + b*x)^m*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/
(d*f*h*(2*m + 3)), x] + Dist[1/(d*f*h*(2*m + 3)), Int[((a + b*x)^(m - 1)/(S
qrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]))*Simp[a*A*d*f*h*(2*m + 3) - C*(a*
(d*e*g + c*f*g + c*e*h) + 2*b*c*e*g*m) + ((A*b + a*B)*d*f*h*(2*m + 3) - C*(
2*a*(d*f*g + d*e*h + c*f*h) + b*(2*m + 1)*(d*e*g + c*f*g + c*e*h)))*x + (b*
B*d*f*h*(2*m + 3) + 2*C*(a*d*f*h*m - b*(m + 1)*(d*f*g + d*e*h + c*f*h)))*x^
2, x], x], x] /; FreeQ[{a, b, c, d, e, f, g, h, A, B, C}, x] && IntegerQ[2*
m] && GtQ[m, 0]
```

Rule 1615

```
Int[(Px_)*((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f
_.)*(x_))^(p_.), x_Symbol] :> With[{q = Expon[Px, x], k = Coeff[Px, x, Expo
n[Px, x]]}, Simp[(k*(a + b*x)^(m + q - 1)*(c + d*x)^(n + 1)*(e + f*x)^(p +
1))/(d*f*b^(q - 1)*(m + n + p + q + 1)), x] + Dist[1/(d*f*b^q*(m + n + p +
q + 1)), Int[(a + b*x)^m*(c + d*x)^n*(e + f*x)^p*ExpandToSum[d*f*b^q*(m + n
+ p + q + 1)*Px - d*f*k*(m + n + p + q + 1)*(a + b*x)^q + k*(a + b*x)^(q -
2)*(a^2*d*f*(m + n + p + q + 1) - b*(b*c*e*(m + q - 1) + a*(d*e*(n + 1) +
c*f*(p + 1))) + b*(a*d*f*(2*(m + q) + n + p) - b*(d*e*(m + q + n) + c*f*(m
+ q + p)))*x], x], x] /; NeQ[m + n + p + q + 1, 0] /; FreeQ[{a, b, c,
d, e, f, m, n, p}, x] && PolyQ[Px, x] && IntegersQ[2*m, 2*n, 2*p]
```

Rule 158

```
Int[((g_.) + (h_.)*(x_))/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]*
Sqrt[(e_.) + (f_.)*(x_)]), x_Symbol] :> Dist[h/f, Int[Sqrt[e + f*x]/(Sqrt[a
+ b*x]*Sqrt[c + d*x]), x], x] + Dist[(f*g - e*h)/f, Int[1/(Sqrt[a + b*x]*Sq
rt[c + d*x]*Sqrt[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x] &&
SimplerQ[a + b*x, e + f*x] && SimplerQ[c + d*x, e + f*x]
```

Rule 114

```
Int[Sqrt[(e_.) + (f_.)*(x_)]/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_
)]), x_Symbol] :> Dist[(Sqrt[e + f*x]*Sqrt[(b*(c + d*x))/(b*c - a*d)])/(Sqr
t[c + d*x]*Sqrt[(b*(e + f*x))/(b*e - a*f)]), Int[Sqrt[(b*e)/(b*e - a*f) + (
b*f*x)/(b*e - a*f)]/(Sqrt[a + b*x]*Sqrt[(b*c)/(b*c - a*d) + (b*d*x)/(b*c -
```

```
a*d))), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && !(GtQ[b/(b*c - a*d), 0]
&& GtQ[b/(b*e - a*f), 0]) && !LtQ[-((b*c - a*d)/d), 0]
```

Rule 113

```
Int[Sqrt[(e_.) + (f_.)*(x_)]/(Sqrt[(a_) + (b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_
)]), x_Symbol] := Simp[(2*Rt[-((b*e - a*f)/d), 2]*EllipticE[ArcSin[Sqrt[a +
b*x]/Rt[-((b*c - a*d)/d), 2]], (f*(b*c - a*d))/(d*(b*e - a*f))]/b, x] /;
FreeQ[{a, b, c, d, e, f}, x] && GtQ[b/(b*c - a*d), 0] && GtQ[b/(b*e - a*f),
0] && !LtQ[-((b*c - a*d)/d), 0] && !(SimplerQ[c + d*x, a + b*x] && GtQ[-
(d/(b*c - a*d)), 0] && GtQ[d/(d*e - c*f), 0] && !LtQ[(b*c - a*d)/b, 0])
```

Rule 121

```
Int[1/(Sqrt[(a_) + (b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x
_)]), x_Symbol] := Dist[Sqrt[(b*(c + d*x))/(b*c - a*d)]/Sqrt[c + d*x], Int[
1/(Sqrt[a + b*x]*Sqrt[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)]*Sqrt[e + f*x
]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && !GtQ[(b*c - a*d)/b, 0] && Si
mplerQ[a + b*x, c + d*x] && SimplerQ[a + b*x, e + f*x]
```

Rule 119

```
Int[1/(Sqrt[(a_) + (b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x
_)]), x_Symbol] := Simp[(2*Rt[-(b/d), 2]*EllipticF[ArcSin[Sqrt[a + b*x]/(Rt
[-(b/d), 2]*Sqrt[(b*c - a*d)/b])], (f*(b*c - a*d))/(d*(b*e - a*f))]/(b*Sqr
t[(b*e - a*f)/b]), x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[(b*c - a*d)/b,
0] && GtQ[(b*e - a*f)/b, 0] && PosQ[-(b/d)] && !(SimplerQ[c + d*x, a + b*
x] && GtQ[(d*e - c*f)/d, 0] && GtQ[-(d/b), 0]) && !(SimplerQ[c + d*x, a +
b*x] && GtQ[(-(b*e) + a*f)/f, 0] && GtQ[-(f/b), 0]) && !(SimplerQ[e + f*x,
a + b*x] && GtQ[(-(d*e) + c*f)/f, 0] && GtQ[(-(b*e) + a*f)/f, 0] && (PosQ[
-(f/d)] || PosQ[-(f/b)]))
```

Rubi steps

$$\begin{aligned}
\int \frac{(7+5x)^4}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}} dx &= -\frac{25}{84}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^2 + \frac{1}{168} \int \frac{(7+5x)(48949+134855x+1281)}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}} \\
&= -\frac{305}{24}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x) - \frac{25}{84}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^2 - \\
&= -\frac{120355}{288}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x} - \frac{305}{24}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x) - \frac{25}{84}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^2 \\
&= -\frac{120355}{288}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x} - \frac{305}{24}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x) - \frac{25}{84}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^2 \\
&= -\frac{120355}{288}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x} - \frac{305}{24}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x) - \frac{25}{84}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^2 \\
&= -\frac{120355}{288}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x} - \frac{305}{24}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x) - \frac{25}{84}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^2
\end{aligned}$$

Mathematica [A] time = 0.496743, size = 125, normalized size = 0.62

$$\frac{392989907\sqrt{66}\sqrt{5-2x}\text{EllipticF}\left(\sin^{-1}\left(\sqrt{\frac{3}{11}}\sqrt{4x+1}\right), \frac{1}{3}\right) - 1650\sqrt{2-3x}\sqrt{4x+1}(1200x^3 + 10608x^2 + 50078x - 210245) - 449665480\sqrt{66}\sqrt{5-2x}\text{EllipticE}\left[\text{ArcSin}\left[\sqrt{\frac{3}{11}}\sqrt{1+4x}\right], \frac{1}{3}\right] + 392989907\sqrt{66}\sqrt{5-2x}\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{3}{11}}\sqrt{1+4x}\right], \frac{1}{3}\right]}{133056\sqrt{2x-5}}$$

Antiderivative was successfully verified.

[In] Integrate[(7 + 5*x)^4/(Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]),x]

[Out] (-1650*Sqrt[2 - 3*x]*Sqrt[1 + 4*x]*(-210245 + 50078*x + 10608*x^2 + 1200*x^3) - 449665480*Sqrt[66]*Sqrt[5 - 2*x]*EllipticE[ArcSin[Sqrt[3/11]*Sqrt[1 + 4*x]], 1/3] + 392989907*Sqrt[66]*Sqrt[5 - 2*x]*EllipticF[ArcSin[Sqrt[3/11]*Sqrt[1 + 4*x]], 1/3])/(133056*Sqrt[-5 + 2*x])

Maple [A] time = 0.024, size = 150, normalized size = 0.7

$$\frac{1}{3193344x^3 - 9313920x^2 + 2794176x + 1330560}\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}\left(1178969721\sqrt{11}\sqrt{2-3x}\sqrt{5-2x}\sqrt{4x+1}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `int((7+5*x)^4/(2-3*x)^(1/2)/(2*x-5)^(1/2)/(4*x+1)^(1/2),x)`

[Out] $1/133056*(2-3*x)^{(1/2)}*(2*x-5)^{(1/2)}*(4*x+1)^{(1/2)}*(1178969721*11^{(1/2)}*(2-3*x)^{(1/2)}*(5-2*x)^{(1/2)}*(4*x+1)^{(1/2)}*\text{EllipticF}(2/11*(22-33*x)^{(1/2)},1/2*I*2^{(1/2)})-899330960*11^{(1/2)}*(2-3*x)^{(1/2)}*(5-2*x)^{(1/2)}*(4*x+1)^{(1/2)}*\text{EllipticE}(2/11*(22-33*x)^{(1/2)},1/2*I*2^{(1/2)})-23760000*x^5-200138400*x^4-900068400*x^3+4611000900*x^2-1569263850*x-693808500)/(24*x^3-70*x^2+21*x+10)$

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(5x+7)^4}{\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((7+5*x)^4/(2-3*x)^(1/2)/(-5+2*x)^(1/2)/(1+4*x)^(1/2),x, algorithm="maxima")`

[Out] `integrate((5*x + 7)^4/(sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)), x)`

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{(625x^4 + 3500x^3 + 7350x^2 + 6860x + 2401)\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2}}{24x^3 - 70x^2 + 21x + 10}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((7+5*x)^4/(2-3*x)^(1/2)/(-5+2*x)^(1/2)/(1+4*x)^(1/2),x, algorithm="fricas")`

[Out] `integral(-(625*x^4 + 3500*x^3 + 7350*x^2 + 6860*x + 2401)*sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)/(24*x^3 - 70*x^2 + 21*x + 10), x)`

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(5x+7)^4}{\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((7+5*x)**4/(2-3*x)**(1/2)/(-5+2*x)**(1/2)/(1+4*x)**(1/2),x)

[Out] Integral((5*x + 7)**4/(sqrt(2 - 3*x)*sqrt(2*x - 5)*sqrt(4*x + 1)), x)

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(5x + 7)^4}{\sqrt{4x + 1}\sqrt{2x - 5}\sqrt{-3x + 2}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((7+5*x)^4/(2-3*x)^(1/2)/(-5+2*x)^(1/2)/(1+4*x)^(1/2),x, algorithm="giac")

[Out] integrate((5*x + 7)^4/(sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)), x)

$$3.61 \quad \int \frac{(7+5x)^3}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}} dx$$

Optimal. Leaf size=165

$$\frac{2474201\sqrt{5-2x}\text{EllipticF}\left(\sin^{-1}\left(\sqrt{\frac{3}{11}}\sqrt{4x+1}\right), \frac{1}{3}\right)}{216\sqrt{66}\sqrt{2x-5}} - \frac{5}{12}\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}(5x+7) - \frac{2135}{108}\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}$$

[Out] (-2135*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/108 - (5*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(7 + 5*x))/12 - (487585*Sqrt[11]*Sqrt[-5 + 2*x]*EllipticE[ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2])/(1296*Sqrt[5 - 2*x]) + (2474201*Sqrt[5 - 2*x]*EllipticF[ArcSin[Sqrt[3/11]*Sqrt[1 + 4*x]], 1/3])/(216*Sqrt[66]*Sqrt[-5 + 2*x])

Rubi [A] time = 0.15253, antiderivative size = 165, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}} = 0.2$, Rules used = {167, 1615, 158, 114, 113, 121, 119}

$$-\frac{5}{12}\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}(5x+7) - \frac{2135}{108}\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1} + \frac{2474201\sqrt{5-2x}\text{F}\left(\sin^{-1}\left(\sqrt{\frac{3}{11}}\sqrt{4x+1}\right)\middle|\frac{1}{3}\right)}{216\sqrt{66}\sqrt{2x-5}}$$

Antiderivative was successfully verified.

[In] Int[(7 + 5*x)^3/(Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]), x]

[Out] (-2135*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/108 - (5*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(7 + 5*x))/12 - (487585*Sqrt[11]*Sqrt[-5 + 2*x]*EllipticE[ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2])/(1296*Sqrt[5 - 2*x]) + (2474201*Sqrt[5 - 2*x]*EllipticF[ArcSin[Sqrt[3/11]*Sqrt[1 + 4*x]], 1/3])/(216*Sqrt[66]*Sqrt[-5 + 2*x])

Rule 167

Int[((a_.) + (b_.)*(x_))^(m_)/(Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] :> Simp[(2*b^2*(a + b*x)^(m - 2)*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(d*f*h*(2*m - 1)), x] - Dist[1/(d*f*h*(2*m - 1)), Int[((a + b*x)^(m - 3)/(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]))*Simp[a*b^2*(d*e*g + c*f*g + c*e*h) + 2*b^3*c*e*g*(m - 2) - a^3*d*f*h*(2*m - 1) + b*(2*a*b*(d*f*g + d*e*h + c*f*h) + b^2*(2*m - 3)*(d*e*g + c*f*g + c*e*h) - 3*a^2*d*f*h*(2*m - 1))*x - 2*b^2*(m - 1)*(3*a*d*f*h - b*(

$d*f*g + d*e*h + c*f*h$)*x², x], x], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x] && IntegerQ[2*m] && GeQ[m, 2]

Rule 1615

Int[(Px_)*((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p_.), x_Symbol] := With[{q = Expon[Px, x], k = Coeff[Px, x, Expon[Px, x]]}, Simp[(k*(a + b*x)^(m + q - 1)*(c + d*x)^(n + 1)*(e + f*x)^(p + 1))/(d*f*b^(q - 1)*(m + n + p + q + 1)), x] + Dist[1/(d*f*b^q*(m + n + p + q + 1)), Int[(a + b*x)^m*(c + d*x)^n*(e + f*x)^p*ExpandToSum[d*f*b^q*(m + n + p + q + 1)*Px - d*f*k*(m + n + p + q + 1)*(a + b*x)^q + k*(a + b*x)^(q - 2)*(a^2*d*f*(m + n + p + q + 1) - b*(b*c*e*(m + q - 1) + a*(d*e*(n + 1) + c*f*(p + 1))) + b*(a*d*f*(2*(m + q) + n + p) - b*(d*e*(m + q + n) + c*f*(m + q + p)))*x], x], x] /; NeQ[m + n + p + q + 1, 0] /; FreeQ[{a, b, c, d, e, f, m, n, p}, x] && PolyQ[Px, x] && IntegersQ[2*m, 2*n, 2*p]

Rule 158

Int[((g_.) + (h_.)*(x_))/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]), x_Symbol] := Dist[h/f, Int[Sqrt[e + f*x]/(Sqrt[a + b*x]*Sqrt[c + d*x]), x], x] + Dist[(f*g - e*h)/f, Int[1/(Sqrt[a + b*x]*Sqrt[c + d*x]*Sqrt[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x] && SimplerQ[a + b*x, e + f*x] && SimplerQ[c + d*x, e + f*x]

Rule 114

Int[Sqrt[(e_.) + (f_.)*(x_)]/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]), x_Symbol] := Dist[(Sqrt[e + f*x]*Sqrt[(b*(c + d*x))/(b*c - a*d)])/(Sqrt[c + d*x]*Sqrt[(b*(e + f*x))/(b*e - a*f)]), Int[Sqrt[(b*e)/(b*e - a*f) + (b*f*x)/(b*e - a*f)]/(Sqrt[a + b*x]*Sqrt[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && !(GtQ[b/(b*c - a*d), 0] && GtQ[b/(b*e - a*f), 0]) && !LtQ[-((b*c - a*d)/d), 0]

Rule 113

Int[Sqrt[(e_.) + (f_.)*(x_)]/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]), x_Symbol] := Simp[(2*Rt[-((b*e - a*f)/d), 2]*EllipticE[ArcSin[Sqrt[a + b*x]/Rt[-((b*c - a*d)/d), 2]], (f*(b*c - a*d))/(d*(b*e - a*f))]/b, x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[b/(b*c - a*d), 0] && GtQ[b/(b*e - a*f), 0] && !LtQ[-((b*c - a*d)/d), 0] && !(SimplerQ[c + d*x, a + b*x] && GtQ[-(d/(b*c - a*d)), 0] && GtQ[d/(d*e - c*f), 0] && !LtQ[(b*c - a*d)/b, 0])

Rule 121

Int[1/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]), x_Symbol] := Dist[1/(Sqrt[a + b*x]*Sqrt[c + d*x]*Sqrt[e + f*x]), x], x]


```

_)), x_Symbol] := Dist[Sqrt[(b*(c + d*x))/(b*c - a*d)]/Sqrt[c + d*x], Int[
1/(Sqrt[a + b*x]*Sqrt[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)]*Sqrt[e + f*x
]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && !GtQ[(b*c - a*d)/b, 0] && Si
mplerQ[a + b*x, c + d*x] && SimplerQ[a + b*x, e + f*x]

```

Rule 119

```

Int[1/(Sqrt[(a_) + (b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x
_)]), x_Symbol] := Simp[(2*Rt[-(b/d), 2]*EllipticF[ArcSin[Sqrt[a + b*x]/(Rt
[-(b/d), 2]*Sqrt[(b*c - a*d)/b]]], (f*(b*c - a*d))/(d*(b*e - a*f)))/(b*Sqr
t[(b*e - a*f)/b]), x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[(b*c - a*d)/b,
0] && GtQ[(b*e - a*f)/b, 0] && PosQ[-(b/d)] && !(SimplerQ[c + d*x, a + b*
x] && GtQ[(d*e - c*f)/d, 0] && GtQ[-(d/b), 0]) && !(SimplerQ[c + d*x, a +
b*x] && GtQ[(-(b*e) + a*f)/f, 0] && GtQ[-(f/b), 0]) && !(SimplerQ[e + f*x,
a + b*x] && GtQ[(-(d*e) + c*f)/f, 0] && GtQ[(-(b*e) + a*f)/f, 0] && (PosQ[
-(f/d)] || PosQ[-(f/b)]))

```

Rubi steps

$$\begin{aligned}
\int \frac{(7+5x)^3}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}} dx &= -\frac{5}{12}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x) + \frac{1}{120} \int \frac{34985+104825x+85400x^2}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}} dx \\
&= -\frac{2135}{108}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x} - \frac{5}{12}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x) + \frac{\int \frac{1088}{\sqrt{2-3x}} dx}{432} \\
&= -\frac{2135}{108}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x} - \frac{5}{12}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x) + \frac{487585}{432} \\
&= -\frac{2135}{108}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x} - \frac{5}{12}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x) + \frac{(24742)}{432} \\
&= -\frac{2135}{108}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x} - \frac{5}{12}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x) - \frac{487585}{432}
\end{aligned}$$

Mathematica [A] time = 0.346811, size = 120, normalized size = 0.73

$$\frac{4948402\sqrt{66}\sqrt{5-2x}\text{EllipticF}\left(\sin^{-1}\left(\sqrt{\frac{3}{11}}\sqrt{4x+1}\right), \frac{1}{3}\right) - 6600\sqrt{2-3x}\sqrt{4x+1}(18x^2+151x-490) - 5363435\sqrt{66}\sqrt{2x-5}}{28512\sqrt{2x-5}}$$

Antiderivative was successfully verified.

[In] Integrate[(7 + 5*x)^3/(Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]),x]

[Out] (-6600*Sqrt[2 - 3*x]*Sqrt[1 + 4*x]*(-490 + 151*x + 18*x^2) - 5363435*Sqrt[66]*Sqrt[5 - 2*x]*EllipticE[ArcSin[Sqrt[3/11]*Sqrt[1 + 4*x]], 1/3] + 4948402*Sqrt[66]*Sqrt[5 - 2*x]*EllipticF[ArcSin[Sqrt[3/11]*Sqrt[1 + 4*x]], 1/3])/ (28512*Sqrt[-5 + 2*x])

Maple [A] time = 0.017, size = 145, normalized size = 0.9

$$\frac{1}{342144x^3 - 997920x^2 + 299376x + 142560} \sqrt{2-3x} \sqrt{2x-5} \sqrt{4x+1} \left(7422603 \sqrt{11} \sqrt{2-3x} \sqrt{5-2x} \sqrt{4x+1} \text{EllipticE} \right.$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((7+5*x)^3/(2-3*x)^(1/2)/(2*x-5)^(1/2)/(4*x+1)^(1/2),x)

[Out] 1/14256*(2-3*x)^(1/2)*(2*x-5)^(1/2)*(4*x+1)^(1/2)*(7422603*11^(1/2)*(2-3*x)^(1/2)*(5-2*x)^(1/2)*(4*x+1)^(1/2)*EllipticF(2/11*(22-33*x)^(1/2),1/2*I*2^(1/2))-5363435*11^(1/2)*(2-3*x)^(1/2)*(5-2*x)^(1/2)*(4*x+1)^(1/2)*EllipticE(2/11*(22-33*x)^(1/2),1/2*I*2^(1/2))-712800*x^4-5682600*x^3+22014300*x^2-7088400*x-3234000)/(24*x^3-70*x^2+21*x+10)

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(5x+7)^3}{\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((7+5*x)^3/(2-3*x)^(1/2)/(-5+2*x)^(1/2)/(1+4*x)^(1/2),x, algorithm="maxima")

[Out] integrate((5*x + 7)^3/(sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)), x)

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral} \left(-\frac{(125x^3 + 525x^2 + 735x + 343)\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2}}{24x^3 - 70x^2 + 21x + 10}, x \right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((7+5*x)^3/(2-3*x)^(1/2)/(-5+2*x)^(1/2)/(1+4*x)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-(125*x^3 + 525*x^2 + 735*x + 343)*sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)/(24*x^3 - 70*x^2 + 21*x + 10), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(5x + 7)^3}{\sqrt{2 - 3x}\sqrt{2x - 5}\sqrt{4x + 1}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((7+5*x)**3/(2-3*x)**(1/2)/(-5+2*x)**(1/2)/(1+4*x)**(1/2),x)
```

```
[Out] Integral((5*x + 7)**3/(sqrt(2 - 3*x)*sqrt(2*x - 5)*sqrt(4*x + 1)), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(5x + 7)^3}{\sqrt{4x + 1}\sqrt{2x - 5}\sqrt{-3x + 2}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((7+5*x)^3/(2-3*x)^(1/2)/(-5+2*x)^(1/2)/(1+4*x)^(1/2),x, algorithm="giac")
```

```
[Out] integrate((5*x + 7)^3/(sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)), x)
```

$$3.62 \quad \int \frac{(7+5x)^2}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}} dx$$

Optimal. Leaf size=129

$$\frac{24353\sqrt{5-2x}\text{EllipticF}\left(\sin^{-1}\left(\sqrt{\frac{3}{11}}\sqrt{4x+1}\right), \frac{1}{3}\right)}{36\sqrt{66}\sqrt{2x-5}} - \frac{25}{36}\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1} - \frac{2135\sqrt{11}\sqrt{2x-5}E\left(\sin^{-1}\left(\frac{2\sqrt{2-3x}}{\sqrt{11}}\right)\right)}{108\sqrt{5-2x}}$$

[Out] (-25*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/36 - (2135*Sqrt[11]*Sqrt[-5 + 2*x]*EllipticE[ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2])/(108*Sqrt[5 - 2*x]) + (24353*Sqrt[5 - 2*x]*EllipticF[ArcSin[Sqrt[3/11]*Sqrt[1 + 4*x]], 1/3])/(36*Sqrt[66]*Sqrt[-5 + 2*x])

Rubi [A] time = 0.0627385, antiderivative size = 129, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}} = 0.2$, Rules used = {167, 24, 158, 114, 113, 121, 119}

$$-\frac{25}{36}\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1} + \frac{24353\sqrt{5-2x}F\left(\sin^{-1}\left(\sqrt{\frac{3}{11}}\sqrt{4x+1}\right), \frac{1}{3}\right)}{36\sqrt{66}\sqrt{2x-5}} - \frac{2135\sqrt{11}\sqrt{2x-5}E\left(\sin^{-1}\left(\frac{2\sqrt{2-3x}}{\sqrt{11}}\right)\right)}{108\sqrt{5-2x}}$$

Antiderivative was successfully verified.

[In] Int[(7 + 5*x)^2/(Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]), x]

[Out] (-25*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/36 - (2135*Sqrt[11]*Sqrt[-5 + 2*x]*EllipticE[ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2])/(108*Sqrt[5 - 2*x]) + (24353*Sqrt[5 - 2*x]*EllipticF[ArcSin[Sqrt[3/11]*Sqrt[1 + 4*x]], 1/3])/(36*Sqrt[66]*Sqrt[-5 + 2*x])

Rule 167

Int[((a_.) + (b_.)*(x_))^(m_)/(Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Simp[(2*b^2*(a + b*x)^(m - 2)*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(d*f*h*(2*m - 1)), x] - Dist[1/(d*f*h*(2*m - 1)), Int[((a + b*x)^(m - 3)/(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]))*Simp[a*b^2*(d*e*g + c*f*g + c*e*h) + 2*b^3*c*e*g*(m - 2) - a^3*d*f*h*(2*m - 1) + b*(2*a*b*(d*f*g + d*e*h + c*f*h) + b^2*(2*m - 3)*(d*e*g + c*f*g + c*e*h) - 3*a^2*d*f*h*(2*m - 1))*x - 2*b^2*(m - 1)*(3*a*d*f*h - b*(d*f*g + d*e*h + c*f*h))*x^2, x], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x] && IntegerQ[2*m] && GeQ[m, 2]

Rule 24

```
Int[(u_.)*((a_) + (b_.)*(v_))^(m_)*((A_.) + (B_.)*(v_) + (C_.)*(v_)^2), x_Symbol] := Dist[1/b^2, Int[u*(a + b*v)^(m + 1)*Simp[b*B - a*C + b*C*v, x], x], x] /; FreeQ[{a, b, A, B, C}, x] && EqQ[A*b^2 - a*b*B + a^2*C, 0] && LeQ[m, -1]
```

Rule 158

```
Int[((g_.) + (h_.)*(x_))/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]), x_Symbol] := Dist[h/f, Int[Sqrt[e + f*x]/(Sqrt[a + b*x]*Sqrt[c + d*x]), x], x] + Dist[(f*g - e*h)/f, Int[1/(Sqrt[a + b*x]*Sqrt[c + d*x]*Sqrt[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x] && SimplifierQ[a + b*x, e + f*x] && SimplifierQ[c + d*x, e + f*x]
```

Rule 114

```
Int[Sqrt[(e_.) + (f_.)*(x_)]/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]), x_Symbol] := Dist[(Sqrt[e + f*x]*Sqrt[(b*(c + d*x))/(b*c - a*d)])/(Sqrt[c + d*x]*Sqrt[(b*(e + f*x))/(b*e - a*f)]), Int[Sqrt[(b*e)/(b*e - a*f)] + (b*f*x)/(b*e - a*f)/(Sqrt[a + b*x]*Sqrt[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && !(GtQ[b/(b*c - a*d), 0] && GtQ[b/(b*e - a*f), 0]) && !LtQ[-((b*c - a*d)/d), 0]
```

Rule 113

```
Int[Sqrt[(e_.) + (f_.)*(x_)]/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]), x_Symbol] := Simp[(2*Rt[-((b*e - a*f)/d), 2]*EllipticE[ArcSin[Sqrt[a + b*x]/Rt[-((b*c - a*d)/d), 2]], (f*(b*c - a*d))/(d*(b*e - a*f))]/b, x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[b/(b*c - a*d), 0] && GtQ[b/(b*e - a*f), 0] && !LtQ[-((b*c - a*d)/d), 0] && !(SimplifierQ[c + d*x, a + b*x] && GtQ[-(d/(b*c - a*d)), 0] && GtQ[d/(d*e - c*f), 0] && !LtQ[(b*c - a*d)/b, 0])
```

Rule 121

```
Int[1/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]), x_Symbol] := Dist[Sqrt[(b*(c + d*x))/(b*c - a*d)]/Sqrt[c + d*x], Int[1/(Sqrt[a + b*x]*Sqrt[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)]*Sqrt[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && !GtQ[(b*c - a*d)/b, 0] && SimplifierQ[a + b*x, c + d*x] && SimplifierQ[a + b*x, e + f*x]
```

Rule 119

```
Int[1/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]), x_Symbol] := Simp[(2*Rt[-(b/d), 2]*EllipticF[ArcSin[Sqrt[a + b*x]/(Rt
```

```
[-(b/d), 2]*Sqrt[(b*c - a*d)/b]], (f*(b*c - a*d))/(d*(b*e - a*f)))]/(b*Sqr
t[(b*e - a*f)/b]), x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[(b*c - a*d)/b,
0] && GtQ[(b*e - a*f)/b, 0] && PosQ[-(b/d)] && !(SimplerQ[c + d*x, a + b*
x] && GtQ[(d*e - c*f)/d, 0] && GtQ[-(d/b), 0]) && !(SimplerQ[c + d*x, a +
b*x] && GtQ[-(b*e) + a*f)/f, 0] && GtQ[-(f/b), 0]) && !(SimplerQ[e + f*x,
a + b*x] && GtQ[-(d*e) + c*f)/f, 0] && GtQ[-(b*e) + a*f)/f, 0] && (PosQ[
-(f/d)] || PosQ[-(f/b)]))
```

Rubi steps

$$\begin{aligned}
\int \frac{(7+5x)^2}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}} dx &= -\frac{25}{36}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x} + \frac{1}{72} \int \frac{21021 + 74795x + 42700x^2}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)} dx \\
&= -\frac{25}{36}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x} + \frac{\int \frac{75075+213500x}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}} dx}{1800} \\
&= -\frac{25}{36}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x} + \frac{2135}{36} \int \frac{\sqrt{-5+2x}}{\sqrt{2-3x}\sqrt{1+4x}} dx + \frac{24353}{72} \int \frac{1}{\sqrt{2-3x}} dx \\
&= -\frac{25}{36}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x} + \frac{(24353\sqrt{5-2x}) \int \frac{1}{\sqrt{2-3x}\sqrt{\frac{10-4x}{11}-\frac{4x}{11}}\sqrt{1+4x}} dx}{36\sqrt{22}\sqrt{-5+2x}} + \frac{(2135\sqrt{11}\sqrt{-5+2x}) \left(\sin^{-1} \left(\frac{2\sqrt{2-3x}}{\sqrt{11}} \right) \right) - \frac{1}{2}}{108\sqrt{5-2x}} + \frac{24353}{72} \int \frac{1}{\sqrt{2-3x}} dx
\end{aligned}$$

Mathematica [A] time = 0.238652, size = 115, normalized size = 0.89

$$\frac{24353\sqrt{66}\sqrt{5-2x}\text{EllipticF}\left(\sin^{-1}\left(\sqrt{\frac{3}{11}}\sqrt{4x+1}\right), \frac{1}{3}\right) + 1650\sqrt{2-3x}\sqrt{4x+1}(5-2x) - 23485\sqrt{66}\sqrt{5-2x}E\left(\sin^{-1}\left(\sqrt{\frac{3}{11}}\sqrt{4x+1}\right), \frac{1}{3}\right)}{2376\sqrt{2x-5}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(7 + 5*x)^2/(Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]),x]
```

```
[Out] (1650*Sqrt[2 - 3*x]*(5 - 2*x)*Sqrt[1 + 4*x] - 23485*Sqrt[66]*Sqrt[5 - 2*x]*
EllipticE[ArcSin[Sqrt[3/11]*Sqrt[1 + 4*x]], 1/3] + 24353*Sqrt[66]*Sqrt[5 -
2*x]*EllipticF[ArcSin[Sqrt[3/11]*Sqrt[1 + 4*x]], 1/3])/(2376*Sqrt[-5 + 2*x]
)
```

Maple [A] time = 0.017, size = 140, normalized size = 1.1

$$\frac{1}{57024x^3 - 166320x^2 + 49896x + 23760} \sqrt{2-3x} \sqrt{2x-5} \sqrt{4x+1} \left(73059 \sqrt{11} \sqrt{2-3x} \sqrt{5-2x} \sqrt{4x+1} \text{EllipticF}\left(2\right) \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((7+5*x)^2/(2-3*x)^(1/2)/(2*x-5)^(1/2)/(4*x+1)^(1/2),x)

[Out] 1/2376*(2-3*x)^(1/2)*(2*x-5)^(1/2)*(4*x+1)^(1/2)*(73059*11^(1/2)*(2-3*x)^(1/2)*(5-2*x)^(1/2)*(4*x+1)^(1/2)*EllipticF(2/11*(22-33*x)^(1/2),1/2*I*2^(1/2)))-46970*11^(1/2)*(2-3*x)^(1/2)*(5-2*x)^(1/2)*(4*x+1)^(1/2)*EllipticE(2/11*(22-33*x)^(1/2),1/2*I*2^(1/2))-39600*x^3+115500*x^2-34650*x-16500)/(24*x^3-70*x^2+21*x+10)

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(5x+7)^2}{\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((7+5*x)^2/(2-3*x)^(1/2)/(-5+2*x)^(1/2)/(1+4*x)^(1/2),x, algorithm="maxima")

[Out] integrate((5*x + 7)^2/(sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)), x)

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{(25x^2 + 70x + 49)\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2}}{24x^3 - 70x^2 + 21x + 10}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((7+5*x)^2/(2-3*x)^(1/2)/(-5+2*x)^(1/2)/(1+4*x)^(1/2),x, algorithm="fricas")

[Out] integral(-(25*x^2 + 70*x + 49)*sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)/(24*x^3 - 70*x^2 + 21*x + 10), x)

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(5x + 7)^2}{\sqrt{2 - 3x}\sqrt{2x - 5}\sqrt{4x + 1}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((7+5*x)**2/(2-3*x)**(1/2)/(-5+2*x)**(1/2)/(1+4*x)**(1/2), x)

[Out] Integral((5*x + 7)**2/(sqrt(2 - 3*x)*sqrt(2*x - 5)*sqrt(4*x + 1)), x)

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(5x + 7)^2}{\sqrt{4x + 1}\sqrt{2x - 5}\sqrt{-3x + 2}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((7+5*x)^2/(2-3*x)^(1/2)/(-5+2*x)^(1/2)/(1+4*x)^(1/2), x, algorithm="giac")

[Out] integrate((5*x + 7)^2/(sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)), x)

$$3.63 \quad \int \frac{7+5x}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}} dx$$

Optimal. Leaf size=98

$$\frac{13\sqrt{\frac{3}{22}}\sqrt{5-2x}\text{EllipticF}\left(\sin^{-1}\left(\sqrt{\frac{3}{11}}\sqrt{4x+1}\right), \frac{1}{3}\right)}{\sqrt{2x-5}} - \frac{5\sqrt{11}\sqrt{2x-5}E\left(\sin^{-1}\left(\frac{2\sqrt{2-3x}}{\sqrt{11}}\right)\middle| -\frac{1}{2}\right)}{6\sqrt{5-2x}}$$

[Out] (-5*Sqrt[11]*Sqrt[-5 + 2*x]*EllipticE[ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2])/(6*Sqrt[5 - 2*x]) + (13*Sqrt[3/22]*Sqrt[5 - 2*x]*EllipticF[ArcSin[Sqrt[3/11]*Sqrt[1 + 4*x]], 1/3])/Sqrt[-5 + 2*x]

Rubi [A] time = 0.0368844, antiderivative size = 98, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}} = 0.152$, Rules used = {158, 114, 113, 121, 119}

$$\frac{13\sqrt{\frac{3}{22}}\sqrt{5-2x}F\left(\sin^{-1}\left(\sqrt{\frac{3}{11}}\sqrt{4x+1}\right)\middle|\frac{1}{3}\right)}{\sqrt{2x-5}} - \frac{5\sqrt{11}\sqrt{2x-5}E\left(\sin^{-1}\left(\frac{2\sqrt{2-3x}}{\sqrt{11}}\right)\middle| -\frac{1}{2}\right)}{6\sqrt{5-2x}}$$

Antiderivative was successfully verified.

[In] Int[(7 + 5*x)/(Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]), x]

[Out] (-5*Sqrt[11]*Sqrt[-5 + 2*x]*EllipticE[ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2])/(6*Sqrt[5 - 2*x]) + (13*Sqrt[3/22]*Sqrt[5 - 2*x]*EllipticF[ArcSin[Sqrt[3/11]*Sqrt[1 + 4*x]], 1/3])/Sqrt[-5 + 2*x]

Rule 158

Int[((g_.) + (h_.)*(x_))/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]), x_Symbol] :> Dist[h/f, Int[Sqrt[e + f*x]/(Sqrt[a + b*x]*Sqrt[c + d*x]), x], x] + Dist[(f*g - e*h)/f, Int[1/(Sqrt[a + b*x]*Sqrt[c + d*x]*Sqrt[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x] && SimplifierQ[a + b*x, e + f*x] && SimplifierQ[c + d*x, e + f*x]

Rule 114

Int[Sqrt[(e_.) + (f_.)*(x_)]/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]), x_Symbol] :> Dist[(Sqrt[e + f*x]*Sqrt[(b*(c + d*x))/(b*c - a*d)])/(Sqrt[c + d*x]*Sqrt[(b*(e + f*x))/(b*e - a*f)]), Int[Sqrt[(b*e)/(b*e - a*f)] + (b*f*x)/(b*e - a*f)]/(Sqrt[a + b*x]*Sqrt[(b*c)/(b*c - a*d)] + (b*d*x)/(b*c -

```
a*d)]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && !(GtQ[b/(b*c - a*d), 0]
&& GtQ[b/(b*e - a*f), 0]) && !LtQ[-((b*c - a*d)/d), 0]
```

Rule 113

```
Int[Sqrt[(e_.) + (f_.)*(x_)]/(Sqrt[(a_) + (b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_
)]), x_Symbol] := Simp[(2*Rt[-((b*e - a*f)/d), 2]*EllipticE[ArcSin[Sqrt[a +
b*x]/Rt[-((b*c - a*d)/d), 2]], (f*(b*c - a*d))/(d*(b*e - a*f))]/b, x] /;
FreeQ[{a, b, c, d, e, f}, x] && GtQ[b/(b*c - a*d), 0] && GtQ[b/(b*e - a*f),
0] && !LtQ[-((b*c - a*d)/d), 0] && !(SimplerQ[c + d*x, a + b*x] && GtQ[-
(d/(b*c - a*d)), 0] && GtQ[d/(d*e - c*f), 0] && !LtQ[(b*c - a*d)/b, 0])
```

Rule 121

```
Int[1/(Sqrt[(a_) + (b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x
_)]), x_Symbol] := Dist[Sqrt[(b*(c + d*x))/(b*c - a*d)]/Sqrt[c + d*x], Int[
1/(Sqrt[a + b*x]*Sqrt[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)]*Sqrt[e + f*x
]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && !GtQ[(b*c - a*d)/b, 0] && Si
mplerQ[a + b*x, c + d*x] && SimplerQ[a + b*x, e + f*x]
```

Rule 119

```
Int[1/(Sqrt[(a_) + (b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x
_)]), x_Symbol] := Simp[(2*Rt[-(b/d), 2]*EllipticF[ArcSin[Sqrt[a + b*x]/(Rt
[-(b/d), 2]*Sqrt[(b*c - a*d)/b])], (f*(b*c - a*d))/(d*(b*e - a*f))]/(b*Sqr
t[(b*e - a*f)/b]), x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[(b*c - a*d)/b,
0] && GtQ[(b*e - a*f)/b, 0] && PosQ[-(b/d)] && !(SimplerQ[c + d*x, a + b*
x] && GtQ[(d*e - c*f)/d, 0] && GtQ[-(d/b), 0]) && !(SimplerQ[c + d*x, a +
b*x] && GtQ[(-(b*e) + a*f)/f, 0] && GtQ[-(f/b), 0]) && !(SimplerQ[e + f*x,
a + b*x] && GtQ[(-(d*e) + c*f)/f, 0] && GtQ[(-(b*e) + a*f)/f, 0] && (PosQ[
-(f/d)] || PosQ[-(f/b)]))
```

Rubi steps

$$\begin{aligned}
\int \frac{7+5x}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}} dx &= \frac{5}{2} \int \frac{\sqrt{-5+2x}}{\sqrt{2-3x}\sqrt{1+4x}} dx + \frac{39}{2} \int \frac{1}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}} dx \\
&= \frac{(39\sqrt{5-2x}) \int \frac{1}{\sqrt{2-3x}\sqrt{\frac{10-4x}{11}-\frac{4x}{11}}\sqrt{1+4x}} dx}{\sqrt{22}\sqrt{-5+2x}} + \frac{(5\sqrt{-5+2x}) \int \frac{\sqrt{\frac{15}{11}-\frac{6x}{11}}}{\sqrt{2-3x}\sqrt{\frac{3}{11}+\frac{12x}{11}}} dx}{2\sqrt{5-2x}} \\
&= -\frac{5\sqrt{11}\sqrt{-5+2x}E\left(\sin^{-1}\left(\frac{2\sqrt{2-3x}}{\sqrt{11}}\right)\middle|-\frac{1}{2}\right)}{6\sqrt{5-2x}} + \frac{13\sqrt{\frac{3}{22}}\sqrt{5-2x}F\left(\sin^{-1}\left(\sqrt{\frac{3}{11}}\sqrt{1+4x}\right)\right)}{\sqrt{-5+2x}}
\end{aligned}$$

Mathematica [A] time = 0.451645, size = 187, normalized size = 1.91

$$\frac{-124\sqrt{22}\sqrt{\frac{2x-5}{4x+1}}\sqrt{\frac{3x-2}{4x+1}}(4x+1)^2\text{EllipticF}\left(\sin^{-1}\left(\frac{\sqrt{\frac{11}{3}}}{\sqrt{4x+1}}\right),3\right)+220(6x^2-19x+10)\sqrt{4x+1}+55\sqrt{22}\sqrt{\frac{2x-5}{4x+1}}\sqrt{\frac{3x-2}{4x+1}}(4x+1)}{132\sqrt{2-3x}\sqrt{2x-5}(4x+1)}$$

Antiderivative was successfully verified.

[In] Integrate[(7 + 5*x)/(Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]),x]

[Out] (220*Sqrt[1 + 4*x]*(10 - 19*x + 6*x^2) + 55*Sqrt[22]*Sqrt[(-5 + 2*x)/(1 + 4*x)]*Sqrt[(-2 + 3*x)/(1 + 4*x)]*(1 + 4*x)^2*EllipticE[ArcSin[Sqrt[11/3]/Sqrt[1 + 4*x]], 3] - 124*Sqrt[22]*Sqrt[(-5 + 2*x)/(1 + 4*x)]*Sqrt[(-2 + 3*x)/(1 + 4*x)]*(1 + 4*x)^2*EllipticF[ArcSin[Sqrt[11/3]/Sqrt[1 + 4*x]], 3])/(132*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*(1 + 4*x))

Maple [A] time = 0.015, size = 57, normalized size = 0.6

$$-\frac{\sqrt{11}}{66} \left(117 \text{EllipticF}\left(2/11 \sqrt{22-33x}, i/2\sqrt{2}\right) - 55 \text{EllipticE}\left(2/11 \sqrt{22-33x}, i/2\sqrt{2}\right) \right) \sqrt{5-2x} \frac{1}{\sqrt{2x-5}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((7+5*x)/(2-3*x)^(1/2)/(2*x-5)^(1/2)/(4*x+1)^(1/2),x)

[Out] -1/66*(117*EllipticF(2/11*(22-33*x)^(1/2),1/2*I*2^(1/2))-55*EllipticE(2/11*(22-33*x)^(1/2),1/2*I*2^(1/2)))*(5-2*x)^(1/2)*11^(1/2)/(2*x-5)^(1/2)

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{5x+7}{\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((7+5*x)/(2-3*x)^(1/2)/(-5+2*x)^(1/2)/(1+4*x)^(1/2),x, algorithm="maxima")

[Out] integrate((5*x + 7)/(sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)), x)

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{(5x+7)\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2}}{24x^3-70x^2+21x+10}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((7+5*x)/(2-3*x)^(1/2)/(-5+2*x)^(1/2)/(1+4*x)^(1/2),x, algorithm="fricas")

[Out] integral(-(5*x + 7)*sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)/(24*x^3 - 70*x^2 + 21*x + 10), x)

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{5x+7}{\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((7+5*x)/(2-3*x)**(1/2)/(-5+2*x)**(1/2)/(1+4*x)**(1/2),x)

[Out] Integral((5*x + 7)/(sqrt(2 - 3*x)*sqrt(2*x - 5)*sqrt(4*x + 1)), x)

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{5x+7}{\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((7+5*x)/(2-3*x)^(1/2)/(-5+2*x)^(1/2)/(1+4*x)^(1/2),x, algorithm="
giac")
```

```
[Out] integrate((5*x + 7)/(sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)), x)
```

$$3.64 \quad \int \frac{1}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}} dx$$

Optimal. Leaf size=48

$$\frac{\sqrt{\frac{2}{33}}\sqrt{5-2x}\text{EllipticF}\left(\sin^{-1}\left(\sqrt{\frac{3}{11}}\sqrt{4x+1}\right), \frac{1}{3}\right)}{\sqrt{2x-5}}$$

[Out] (Sqrt[2/33]*Sqrt[5 - 2*x]*EllipticF[ArcSin[Sqrt[3/11]*Sqrt[1 + 4*x]], 1/3])
/Sqrt[-5 + 2*x]

Rubi [A] time = 0.0139663, antiderivative size = 48, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}} = 0.071$, Rules used = {121, 119}

$$\frac{\sqrt{\frac{2}{33}}\sqrt{5-2x}F\left(\sin^{-1}\left(\sqrt{\frac{3}{11}}\sqrt{4x+1}\right)\middle|\frac{1}{3}\right)}{\sqrt{2x-5}}$$

Antiderivative was successfully verified.

[In] Int[1/(Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]),x]

[Out] (Sqrt[2/33]*Sqrt[5 - 2*x]*EllipticF[ArcSin[Sqrt[3/11]*Sqrt[1 + 4*x]], 1/3])
/Sqrt[-5 + 2*x]

Rule 121

```
Int[1/(Sqrt[(a_) + (b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x_)]), x_Symbol] :> Dist[Sqrt[(b*(c + d*x))/(b*c - a*d)]/Sqrt[c + d*x], Int[1/(Sqrt[a + b*x]*Sqrt[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)]*Sqrt[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && !GtQ[(b*c - a*d)/b, 0] && SimplerQ[a + b*x, c + d*x] && SimplerQ[a + b*x, e + f*x]
```

Rule 119

```
Int[1/(Sqrt[(a_) + (b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x_)]), x_Symbol] :> Simp[(2*Rt[-(b/d), 2]*EllipticF[ArcSin[Sqrt[a + b*x]/Rt[-(b/d), 2]*Sqrt[(b*c - a*d)/b]]], (f*(b*c - a*d))/(d*(b*e - a*f)))/(b*Sqrt[(b*e - a*f)/b]), x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[(b*c - a*d)/b, 0] && GtQ[(b*e - a*f)/b, 0] && PosQ[-(b/d)] && !(SimplerQ[c + d*x, a + b*x] && GtQ[(d*e - c*f)/d, 0] && GtQ[-(d/b), 0]) && !(SimplerQ[c + d*x, a +
```

b*x] && GtQ[(-(b*e) + a*f)/f, 0] && GtQ[-(f/b), 0]) && !(SimplerQ[e + f*x, a + b*x] && GtQ[(-(d*e) + c*f)/f, 0] && GtQ[(-(b*e) + a*f)/f, 0] && (PosQ[-(f/d)] || PosQ[-(f/b)]))

Rubi steps

$$\int \frac{1}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}} dx = \frac{\left(\sqrt{\frac{2}{11}}\sqrt{5-2x}\right) \int \frac{1}{\sqrt{2-3x}\sqrt{\frac{10-4x}{11}-\frac{4x}{11}}\sqrt{1+4x}} dx}{\sqrt{-5+2x}}$$

$$= \frac{\sqrt{\frac{2}{33}}\sqrt{5-2x}F\left(\sin^{-1}\left(\sqrt{\frac{3}{11}}\sqrt{1+4x}\right)\middle|\frac{1}{3}\right)}{\sqrt{-5+2x}}$$

Mathematica [A] time = 0.10906, size = 79, normalized size = 1.65

$$\frac{\sqrt{\frac{3x-2}{4x+1}}(4x+1)\sqrt{\frac{4x-10}{44x+11}}\text{EllipticF}\left(\sin^{-1}\left(\frac{\sqrt{\frac{11}{3}}}{\sqrt{4x+1}}\right), 3\right)}{\sqrt{2-3x}\sqrt{2x-5}}$$

Antiderivative was successfully verified.

[In] Integrate[1/(Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]), x]

[Out] -((Sqrt[(-2 + 3*x)/(1 + 4*x)]*(1 + 4*x)*Sqrt[(-10 + 4*x)/(11 + 44*x)]*EllipticF[ArcSin[Sqrt[11/3]/Sqrt[1 + 4*x]], 3])/(Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]))

Maple [C] time = 0.013, size = 36, normalized size = 0.8

$$-\frac{\sqrt{11}}{11}\text{EllipticF}\left(\frac{2}{11}\sqrt{22-33x}, \frac{i}{2}\sqrt{2}\right)\sqrt{5-2x}\frac{1}{\sqrt{2x-5}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(1/(2-3*x)^(1/2)/(2*x-5)^(1/2)/(4*x+1)^(1/2), x)

[Out] -1/11*EllipticF(2/11*(22-33*x)^(1/2), 1/2*I*2^(1/2))*(5-2*x)^(1/2)*11^(1/2)/(2*x-5)^(1/2)

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(2-3*x)^(1/2)/(-5+2*x)^(1/2)/(1+4*x)^(1/2),x, algorithm="maxima")

[Out] integrate(1/(sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)), x)

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2}}{24x^3-70x^2+21x+10}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(2-3*x)^(1/2)/(-5+2*x)^(1/2)/(1+4*x)^(1/2),x, algorithm="fricas")

[Out] integral(-sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)/(24*x^3 - 70*x^2 + 21*x + 10), x)

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(2-3*x)**(1/2)/(-5+2*x)**(1/2)/(1+4*x)**(1/2),x)

[Out] Integral(1/(sqrt(2 - 3*x)*sqrt(2*x - 5)*sqrt(4*x + 1)), x)

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(2-3*x)^(1/2)/(-5+2*x)^(1/2)/(1+4*x)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)), x)
```

$$3.65 \quad \int \frac{1}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x(7+5x)}} dx$$

Optimal. Leaf size=51

$$\frac{3\sqrt{5-2x}\Pi\left(\frac{55}{124}; \sin^{-1}\left(\frac{2\sqrt{2-3x}}{\sqrt{11}}\right) \middle| -\frac{1}{2}\right)}{31\sqrt{11}\sqrt{2x-5}}$$

[Out] (-3*Sqrt[5 - 2*x]*EllipticPi[55/124, ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2])/(31*Sqrt[11]*Sqrt[-5 + 2*x])

Rubi [A] time = 0.0700453, antiderivative size = 51, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}} = 0.086$, Rules used = {168, 538, 537}

$$\frac{3\sqrt{5-2x}\Pi\left(\frac{55}{124}; \sin^{-1}\left(\frac{2\sqrt{2-3x}}{\sqrt{11}}\right) \middle| -\frac{1}{2}\right)}{31\sqrt{11}\sqrt{2x-5}}$$

Antiderivative was successfully verified.

[In] Int[1/(Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(7 + 5*x)),x]

[Out] (-3*Sqrt[5 - 2*x]*EllipticPi[55/124, ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2])/(31*Sqrt[11]*Sqrt[-5 + 2*x])

Rule 168

```
Int[1/(((a_.) + (b_.)*(x_))*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Dist[-2, Subst[Int[1/(Simp[b*c - a*d - b*x^2, x]*Sqrt[Simp[(d*e - c*f)/d + (f*x^2)/d, x]]*Sqrt[Simp[(d*g - c*h)/d + (h*x^2)/d, x]]), x], x, Sqrt[c + d*x]], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x] && GtQ[(d*e - c*f)/d, 0]
```

Rule 538

```
Int[1/(((a_) + (b_.)*(x_)^2)*Sqrt[(c_) + (d_.)*(x_)^2]*Sqrt[(e_) + (f_.)*(x_)^2]), x_Symbol] := Dist[Sqrt[1 + (d*x^2)/c]/Sqrt[c + d*x^2], Int[1/((a + b*x^2)*Sqrt[1 + (d*x^2)/c]*Sqrt[e + f*x^2]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && !GtQ[c, 0]
```

Rule 537

```
Int[1/(((a_) + (b_.)*(x_)^2)*Sqrt[(c_) + (d_.)*(x_)^2]*Sqrt[(e_) + (f_.)*(x_)^2]), x_Symbol] :> Simp[(1*EllipticPi[(b*c)/(a*d), ArcSin[Rt[-(d/c), 2]*x], (c*f)/(d*e)])/(a*Sqrt[c]*Sqrt[e]*Rt[-(d/c), 2]), x] /; FreeQ[{a, b, c, d, e, f}, x] && !GtQ[d/c, 0] && GtQ[c, 0] && GtQ[e, 0] && !( !GtQ[f/e, 0] && SimplerSqrtQ[-(f/e), -(d/c)])]
```

Rubi steps

$$\int \frac{1}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)} dx = - \left(2 \operatorname{Subst} \left(\int \frac{1}{(31-5x^2) \sqrt{\frac{11}{3} - \frac{4x^2}{3}} \sqrt{-\frac{11}{3} - \frac{2x^2}{3}}} dx, x, \sqrt{2-3x} \right) \right)$$

$$= - \frac{\left(2\sqrt{\frac{3}{11}}\sqrt{5-2x} \right) \operatorname{Subst} \left(\int \frac{1}{(31-5x^2) \sqrt{\frac{11}{3} - \frac{4x^2}{3}} \sqrt{1 + \frac{2x^2}{11}}} dx, x, \sqrt{2-3x} \right)}{\sqrt{-5+2x}}$$

$$= - \frac{3\sqrt{5-2x} \Pi \left(\frac{55}{124}; \sin^{-1} \left(\frac{2\sqrt{2-3x}}{\sqrt{11}} \right) \middle| -\frac{1}{2} \right)}{31\sqrt{11}\sqrt{-5+2x}}$$

Mathematica [A] time = 0.468092, size = 99, normalized size = 1.94

$$\frac{3(3x-2)\sqrt{\frac{8x^2-18x-5}{(2-3x)^2}} \left(\operatorname{EllipticF} \left(\sin^{-1} \left(\frac{\sqrt{11}}{2\sqrt{2-3x}} \right), -2 \right) + \Pi \left(\frac{124}{55}; -\sin^{-1} \left(\frac{\sqrt{11}}{2\sqrt{2-3x}} \right) \middle| -2 \right) \right)}{31\sqrt{4x+1}\sqrt{11x-\frac{55}{2}}}$$

Antiderivative was successfully verified.

[In] Integrate[1/(Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(7 + 5*x)),x]

[Out] (-3*(-2 + 3*x)*Sqrt[(-5 - 18*x + 8*x^2)/(2 - 3*x)^2]*(EllipticF[ArcSin[Sqrt[11]/(2*Sqrt[2 - 3*x])], -2] + EllipticPi[124/55, -ArcSin[Sqrt[11]/(2*Sqrt[2 - 3*x])], -2]))/(31*Sqrt[1 + 4*x]*Sqrt[-55/2 + 11*x])

Maple [A] time = 0.016, size = 37, normalized size = 0.7

$$-\frac{3\sqrt{11}}{341} \operatorname{EllipticPi} \left(\frac{2}{11} \sqrt{22-33x}, \frac{55}{124}, \frac{i}{2} \sqrt{2} \right) \sqrt{5-2x} \frac{1}{\sqrt{2x-5}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `int(1/(7+5*x)/(2-3*x)^(1/2)/(2*x-5)^(1/2)/(4*x+1)^(1/2),x)`

[Out] `-3/341*EllipticPi(2/11*(22-33*x)^(1/2),55/124,1/2*I*2^(1/2))*(5-2*x)^(1/2)*11^(1/2)/(2*x-5)^(1/2)`

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(5x+7)\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate(1/(7+5*x)/(2-3*x)^(1/2)/(-5+2*x)^(1/2)/(1+4*x)^(1/2),x, algorithm="maxima")`

[Out] `integrate(1/((5*x + 7)*sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)), x)`

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2}}{120x^4-182x^3-385x^2+197x+70}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate(1/(7+5*x)/(2-3*x)^(1/2)/(-5+2*x)^(1/2)/(1+4*x)^(1/2),x, algorithm="fricas")`

[Out] `integral(-sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)/(120*x^4 - 182*x^3 - 385*x^2 + 197*x + 70), x)`

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}(5x+7)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(7+5*x)/(2-3*x)**(1/2)/(-5+2*x)**(1/2)/(1+4*x)**(1/2),x)

[Out] Integral(1/(sqrt(2 - 3*x)*sqrt(2*x - 5)*sqrt(4*x + 1)*(5*x + 7)), x)

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(5x + 7)\sqrt{4x + 1}\sqrt{2x - 5}\sqrt{-3x + 2}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(7+5*x)/(2-3*x)^(1/2)/(-5+2*x)^(1/2)/(1+4*x)^(1/2),x, algorithm="giac")

[Out] integrate(1/((5*x + 7)*sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)), x)

$$3.66 \quad \int \frac{1}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^2} dx$$

Optimal. Leaf size=189

$$\frac{2\sqrt{\frac{6}{11}}\sqrt{5-2x}\text{EllipticF}\left(\sin^{-1}\left(\sqrt{\frac{3}{11}}\sqrt{4x+1}\right), \frac{1}{3}\right)}{713\sqrt{2x-5}} - \frac{25\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}}{27807(5x+7)} + \frac{10\sqrt{11}\sqrt{2x-5}E\left(\sin^{-1}\left(\frac{2\sqrt{2-3x}}{\sqrt{11}}\right)\right)}{27807\sqrt{5-2x}}$$

```
[Out] (-25*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/(27807*(7 + 5*x)) + (10*Sqrt[11]*Sqrt[-5 + 2*x]*EllipticE[ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2])/(27807*Sqrt[5 - 2*x]) - (2*Sqrt[6/11]*Sqrt[5 - 2*x]*EllipticF[ArcSin[Sqrt[3/11]*Sqrt[1 + 4*x]], 1/3])/(713*Sqrt[-5 + 2*x]) - (8953*Sqrt[5 - 2*x]*EllipticPi[55/124, ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2])/(574678*Sqrt[11]*Sqrt[-5 + 2*x])
```

Rubi [A] time = 0.220147, antiderivative size = 189, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 10, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}} = 0.286$, Rules used = {172, 1607, 168, 538, 537, 158, 114, 113, 121, 119}

$$\frac{25\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}}{27807(5x+7)} - \frac{2\sqrt{\frac{6}{11}}\sqrt{5-2x}F\left(\sin^{-1}\left(\sqrt{\frac{3}{11}}\sqrt{4x+1}\right)\middle|\frac{1}{3}\right)}{713\sqrt{2x-5}} + \frac{10\sqrt{11}\sqrt{2x-5}E\left(\sin^{-1}\left(\frac{2\sqrt{2-3x}}{\sqrt{11}}\right)\middle|-\frac{1}{2}\right)}{27807\sqrt{5-2x}} - 8953\sqrt{5-2x}\text{EllipticPi}\left[\frac{55}{124}, \sin^{-1}\left(\frac{2\sqrt{2-3x}}{\sqrt{11}}\right), -\frac{1}{2}\right]$$

Antiderivative was successfully verified.

```
[In] Int[1/(Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(7 + 5*x)^2), x]
```

```
[Out] (-25*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/(27807*(7 + 5*x)) + (10*Sqrt[11]*Sqrt[-5 + 2*x]*EllipticE[ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2])/(27807*Sqrt[5 - 2*x]) - (2*Sqrt[6/11]*Sqrt[5 - 2*x]*EllipticF[ArcSin[Sqrt[3/11]*Sqrt[1 + 4*x]], 1/3])/(713*Sqrt[-5 + 2*x]) - (8953*Sqrt[5 - 2*x]*EllipticPi[55/124, ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2])/(574678*Sqrt[11]*Sqrt[-5 + 2*x])
```

Rule 172

```
Int[((a_.) + (b_.)*(x_))^(m_)/(Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Simp[(b^2*(a + b*x)^(m + 1)*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/((m + 1)*(b*c - a*d)*(b*e - a*f)*(b*g - a*h)), x] - Dist[1/(2*(m + 1)*(b*c - a*d)*(b*e - a*f)*(b*g - a*h)), Int[((a + b*x)^(m + 1)/(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]))*Simp[2*
```

```
a^2*d*f*h*(m + 1) - 2*a*b*(m + 1)*(d*f*g + d*e*h + c*f*h) + b^2*(2*m + 3)*(
d*e*g + c*f*g + c*e*h) - 2*b*(a*d*f*h*(m + 1) - b*(m + 2)*(d*f*g + d*e*h +
c*f*h))*x + d*f*h*(2*m + 5)*b^2*x^2, x], x] /; FreeQ[{a, b, c, d, e, f,
g, h}, x] && IntegerQ[2*m] && LeQ[m, -2]
```

Rule 1607

```
Int[(Px_)*((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f
_.)*(x_))^(p_.)*((g_.) + (h_.)*(x_))^(q_.), x_Symbol] := Dist[PolynomialRem
ainder[Px, a + b*x, x], Int[(a + b*x)^m*(c + d*x)^n*(e + f*x)^p*(g + h*x)^q
, x], x] + Int[PolynomialQuotient[Px, a + b*x, x]*(a + b*x)^(m + 1)*(c + d*
x)^n*(e + f*x)^p*(g + h*x)^q, x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n, p,
q}, x] && PolyQ[Px, x] && EqQ[m, -1]
```

Rule 168

```
Int[1/(((a_.) + (b_.)*(x_))*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_
)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Dist[-2, Subst[Int[1/(Simp[b*c -
a*d - b*x^2, x]*Sqrt[Simp[(d*e - c*f)/d + (f*x^2)/d, x]]*Sqrt[Simp[(d*g -
c*h)/d + (h*x^2)/d, x]]], x], x, Sqrt[c + d*x]], x] /; FreeQ[{a, b, c, d, e
, f, g, h}, x] && GtQ[(d*e - c*f)/d, 0]
```

Rule 538

```
Int[1/(((a_) + (b_.)*(x_)^2)*Sqrt[(c_) + (d_.)*(x_)^2]*Sqrt[(e_) + (f_.)*(x
_)^2]), x_Symbol] := Dist[Sqrt[1 + (d*x^2)/c]/Sqrt[c + d*x^2], Int[1/((a +
b*x^2)*Sqrt[1 + (d*x^2)/c]*Sqrt[e + f*x^2]), x], x] /; FreeQ[{a, b, c, d, e
, f}, x] && !GtQ[c, 0]
```

Rule 537

```
Int[1/(((a_) + (b_.)*(x_)^2)*Sqrt[(c_) + (d_.)*(x_)^2]*Sqrt[(e_) + (f_.)*(x
_)^2]), x_Symbol] := Simp[(1*EllipticPi[(b*c)/(a*d), ArcSin[Rt[-(d/c), 2]*x
], (c*f)/(d*e)]/(a*Sqrt[c]*Sqrt[e]*Rt[-(d/c), 2]), x] /; FreeQ[{a, b, c, d
, e, f}, x] && !GtQ[d/c, 0] && GtQ[c, 0] && GtQ[e, 0] && !( !GtQ[f/e, 0]
&& SimplerSqrtQ[-(f/e), -(d/c)])
```

Rule 158

```
Int[((g_.) + (h_.)*(x_))/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*
Sqrt[(e_) + (f_.)*(x_)]), x_Symbol] := Dist[h/f, Int[Sqrt[e + f*x]/(Sqrt[a
+ b*x]*Sqrt[c + d*x]), x], x] + Dist[(f*g - e*h)/f, Int[1/(Sqrt[a + b*x]*Sq
rt[c + d*x]*Sqrt[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x] &&
SimplerQ[a + b*x, e + f*x] && SimplerQ[c + d*x, e + f*x]
```

Rule 114

```
Int[Sqrt[(e_) + (f_)*(x_)]/(Sqrt[(a_) + (b_)*(x_)]*Sqrt[(c_) + (d_)*(x_)]), x_Symbol] := Dist[(Sqrt[e + f*x]*Sqrt[(b*(c + d*x))/(b*c - a*d]])/(Sqrt[c + d*x]*Sqrt[(b*(e + f*x))/(b*e - a*f)]), Int[Sqrt[(b*e)/(b*e - a*f) + (b*f*x)/(b*e - a*f)]/(Sqrt[a + b*x]*Sqrt[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && !(GtQ[b/(b*c - a*d), 0] && GtQ[b/(b*e - a*f), 0]) && !LtQ[-((b*c - a*d)/d), 0]
```

Rule 113

```
Int[Sqrt[(e_) + (f_)*(x_)]/(Sqrt[(a_) + (b_)*(x_)]*Sqrt[(c_) + (d_)*(x_)]), x_Symbol] := Simp[(2*Rt[-((b*e - a*f)/d), 2]*EllipticE[ArcSin[Sqrt[a + b*x]/Rt[-((b*c - a*d)/d), 2]], (f*(b*c - a*d))/(d*(b*e - a*f))]/b, x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[b/(b*c - a*d), 0] && GtQ[b/(b*e - a*f), 0] && !LtQ[-((b*c - a*d)/d), 0] && !(SimplerQ[c + d*x, a + b*x] && GtQ[-(d/(b*c - a*d)), 0] && GtQ[d/(d*e - c*f), 0] && !LtQ[(b*c - a*d)/b, 0])
```

Rule 121

```
Int[1/(Sqrt[(a_) + (b_)*(x_)]*Sqrt[(c_) + (d_)*(x_)]*Sqrt[(e_) + (f_)*(x_)]), x_Symbol] := Dist[Sqrt[(b*(c + d*x))/(b*c - a*d)]/Sqrt[c + d*x], Int[1/(Sqrt[a + b*x]*Sqrt[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)]*Sqrt[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && !GtQ[(b*c - a*d)/b, 0] && SimplerQ[a + b*x, c + d*x] && SimplerQ[a + b*x, e + f*x]
```

Rule 119

```
Int[1/(Sqrt[(a_) + (b_)*(x_)]*Sqrt[(c_) + (d_)*(x_)]*Sqrt[(e_) + (f_)*(x_)]), x_Symbol] := Simp[(2*Rt[-(b/d), 2]*EllipticF[ArcSin[Sqrt[a + b*x]/Rt[-(b/d), 2]*Sqrt[(b*c - a*d)/b]]], (f*(b*c - a*d))/(d*(b*e - a*f))]/(b*Sqrt[(b*e - a*f)/b]), x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[(b*c - a*d)/b, 0] && GtQ[(b*e - a*f)/b, 0] && PosQ[-(b/d)] && !(SimplerQ[c + d*x, a + b*x] && GtQ[(d*e - c*f)/d, 0] && GtQ[-(d/b), 0]) && !(SimplerQ[c + d*x, a + b*x] && GtQ[(-(b*e) + a*f)/f, 0] && GtQ[-(f/b), 0]) && !(SimplerQ[e + f*x, a + b*x] && GtQ[-(d*e) + c*f)/f, 0] && GtQ[(-(b*e) + a*f)/f, 0] && (PosQ[-(f/d)] || PosQ[-(f/b)]))
```

Rubi steps

$$\begin{aligned}
\int \frac{1}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^2} dx &= -\frac{25\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{27807(7+5x)} + \frac{\int \frac{7777-1680x-600x^2}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)} dx}{55614} \\
&= -\frac{25\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{27807(7+5x)} + \frac{\int \frac{-168-120x}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}} dx}{55614} + \frac{8953 \int \frac{1}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}} dx}{55614} \\
&= -\frac{25\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{27807(7+5x)} - \frac{10 \int \frac{\sqrt{-5+2x}}{\sqrt{2-3x}\sqrt{1+4x}} dx}{9269} - \frac{6}{713} \int \frac{1}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}} dx \\
&= -\frac{25\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{27807(7+5x)} - \frac{\left(6\sqrt{\frac{2}{11}}\sqrt{5-2x}\right) \int \frac{1}{\sqrt{2-3x}\sqrt{\frac{10}{11}-\frac{4x}{11}}\sqrt{1+4x}} dx}{713\sqrt{-5+2x}} \\
&= -\frac{25\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{27807(7+5x)} + \frac{10\sqrt{11}\sqrt{-5+2x}E\left(\sin^{-1}\left(\frac{2\sqrt{2-3x}}{\sqrt{11}}\right)\middle|-\frac{1}{2}\right)}{27807\sqrt{5-2x}}
\end{aligned}$$

Mathematica [A] time = 0.634306, size = 132, normalized size = 0.7

$$\frac{3\sqrt{55-22x}\left(14508\text{EllipticF}\left(\sin^{-1}\left(\frac{2\sqrt{2-3x}}{\sqrt{11}}\right), -\frac{1}{2}\right) - 6820E\left(\sin^{-1}\left(\frac{2\sqrt{2-3x}}{\sqrt{11}}\right)\middle|-\frac{1}{2}\right) + 26859\Pi\left(\frac{55}{124}; -\sin^{-1}\left(\frac{2\sqrt{2-3x}}{\sqrt{11}}\right)\middle|-\frac{1}{2}\right)\right)}{56893122\sqrt{2x-5}}$$

Antiderivative was successfully verified.

[In] Integrate[1/(Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(7 + 5*x)^2), x]

[Out] ((-51150*Sqrt[2 - 3*x]*(-5 + 2*x)*Sqrt[1 + 4*x])/(7 + 5*x) + 3*Sqrt[55 - 22*x]*(-6820*EllipticE[ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2] + 14508*EllipticF[ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2] + 26859*EllipticPi[55/124, -ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2]))/(56893122*Sqrt[-5 + 2*x])

Maple [B] time = 0.019, size = 320, normalized size = 1.7

$$\frac{1}{(455144976x^3 - 1327506180x^2 + 398251854x + 189643740)(7+5x)}\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}\left(72540\sqrt{11}\sqrt{2-3x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(1/(7+5*x)^2/(2-3*x)^(1/2)/(2*x-5)^(1/2)/(4*x+1)^(1/2),x)

[Out]
$$\frac{-1/18964374*(2-3*x)^{(1/2)}*(2*x-5)^{(1/2)}*(4*x+1)^{(1/2)}*(72540*11^{(1/2)}*(2-3*x)^{(1/2)}*(5-2*x)^{(1/2)}*(4*x+1)^{(1/2)}*\text{EllipticF}(2/11*(22-33*x)^{(1/2)},1/2*I*2^{(1/2)})*x-34100*11^{(1/2)}*(2-3*x)^{(1/2)}*(5-2*x)^{(1/2)}*(4*x+1)^{(1/2)}*\text{EllipticE}(2/11*(22-33*x)^{(1/2)},1/2*I*2^{(1/2)})*x-134295*11^{(1/2)}*(2-3*x)^{(1/2)}*(5-2*x)^{(1/2)}*(4*x+1)^{(1/2)}*\text{EllipticPi}(2/11*(22-33*x)^{(1/2)},55/124,1/2*I*2^{(1/2)})*x+101556*11^{(1/2)}*(2-3*x)^{(1/2)}*(5-2*x)^{(1/2)}*(4*x+1)^{(1/2)}*\text{EllipticF}(2/11*(22-33*x)^{(1/2)},1/2*I*2^{(1/2)})-47740*11^{(1/2)}*(2-3*x)^{(1/2)}*(5-2*x)^{(1/2)}*(4*x+1)^{(1/2)}*\text{EllipticE}(2/11*(22-33*x)^{(1/2)},1/2*I*2^{(1/2)})-188013*11^{(1/2)}*(2-3*x)^{(1/2)}*(5-2*x)^{(1/2)}*(4*x+1)^{(1/2)}*\text{EllipticPi}(2/11*(22-33*x)^{(1/2)},55/124,1/2*I*2^{(1/2)})+409200*x^3-1193500*x^2+358050*x+170500)/(24*x^3-70*x^2+21*x+10)/(7+5*x)}$$

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(5x+7)^2\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(7+5*x)^2/(2-3*x)^(1/2)/(-5+2*x)^(1/2)/(1+4*x)^(1/2),x, algorithm="maxima")

[Out] integrate(1/((5*x + 7)^2*sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)), x)

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2}}{600x^5-70x^4-3199x^3-1710x^2+1729x+490},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(7+5*x)^2/(2-3*x)^(1/2)/(-5+2*x)^(1/2)/(1+4*x)^(1/2),x, algorithm="fricas")

[Out] integral(-sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)/(600*x^5 - 70*x^4 - 3199*x^3 - 1710*x^2 + 1729*x + 490), x)

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(7+5*x)**2/(2-3*x)**(1/2)/(-5+2*x)**(1/2)/(1+4*x)**(1/2),x)

[Out] Exception raised: ValueError

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(5x+7)^2 \sqrt{4x+1} \sqrt{2x-5} \sqrt{-3x+2}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(7+5*x)^2/(2-3*x)^(1/2)/(-5+2*x)^(1/2)/(1+4*x)^(1/2),x, algorithm="giac")

[Out] integrate(1/((5*x + 7)^2*sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)), x)

$$3.67 \quad \int \frac{1}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^3} dx$$

Optimal. Leaf size=225

$$\frac{24007\sqrt{5-2x}\text{EllipticF}\left(\sin^{-1}\left(\sqrt{\frac{3}{11}}\sqrt{4x+1}\right), \frac{1}{3}\right)}{6608797\sqrt{66}\sqrt{2x-5}} - \frac{223825\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}}{1030972332(5x+7)} - \frac{25\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}}{55614(5x+7)^2} +$$

```
[Out] (-25*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/(55614*(7 + 5*x)^2) - (223
825*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/(1030972332*(7 + 5*x)) + (4
4765*Sqrt[11]*Sqrt[-5 + 2*x]*EllipticE[ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]],
-1/2])/(515486166*Sqrt[5 - 2*x]) - (24007*Sqrt[5 - 2*x]*EllipticF[ArcSin[Sq
rt[3/11]*Sqrt[1 + 4*x]], 1/3])/(6608797*Sqrt[66]*Sqrt[-5 + 2*x]) - (4849330
5*Sqrt[5 - 2*x]*EllipticPi[55/124, ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2
])/ (21306761528*Sqrt[11]*Sqrt[-5 + 2*x])
```

Rubi [A] time = 0.309706, antiderivative size = 225, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 11, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}} = 0.314$, Rules used = {172, 1604, 1607, 168, 538, 537, 158, 114, 113, 121, 119}

$$-\frac{223825\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}}{1030972332(5x+7)} - \frac{25\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}}{55614(5x+7)^2} - \frac{24007\sqrt{5-2x}F\left(\sin^{-1}\left(\sqrt{\frac{3}{11}}\sqrt{4x+1}\right)\middle|\frac{1}{3}\right)}{6608797\sqrt{66}\sqrt{2x-5}} + \frac{44765\sqrt{11}\text{EllipticE}\left(\text{ArcSin}\left[\frac{2\sqrt{2-3x}}{\sqrt{11}}\right], -\frac{1}{2}\right)}{515486166\sqrt{5-2x}} - \frac{24007\sqrt{5-2x}\text{EllipticF}\left(\text{ArcSin}\left[\sqrt{\frac{3}{11}}\sqrt{4x+1}\right], \frac{1}{3}\right)}{6608797\sqrt{66}\sqrt{2x-5}} - \frac{48493305\sqrt{5-2x}\text{EllipticPi}\left[\frac{55}{124}, \text{ArcSin}\left[\frac{2\sqrt{2-3x}}{\sqrt{11}}\right], -\frac{1}{2}\right]}{21306761528\sqrt{11}\sqrt{2x-5}}$$

Antiderivative was successfully verified.

```
[In] Int[1/(Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(7 + 5*x)^3), x]
```

```
[Out] (-25*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/(55614*(7 + 5*x)^2) - (223
825*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/(1030972332*(7 + 5*x)) + (4
4765*Sqrt[11]*Sqrt[-5 + 2*x]*EllipticE[ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]],
-1/2])/(515486166*Sqrt[5 - 2*x]) - (24007*Sqrt[5 - 2*x]*EllipticF[ArcSin[Sq
rt[3/11]*Sqrt[1 + 4*x]], 1/3])/(6608797*Sqrt[66]*Sqrt[-5 + 2*x]) - (4849330
5*Sqrt[5 - 2*x]*EllipticPi[55/124, ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2
])/ (21306761528*Sqrt[11]*Sqrt[-5 + 2*x])
```

Rule 172

```
Int[((a_.) + (b_.)*(x_))^(m_)/(Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*
(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Simp[(b^2*(a + b*x)^(m + 1)*S
qrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/((m + 1)*(b*c - a*d)*(b*e - a*f)*
```

```
(b*g - a*h)), x] - Dist[1/(2*(m + 1)*(b*c - a*d)*(b*e - a*f)*(b*g - a*h)),
Int[((a + b*x)^(m + 1)/(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]))*Simp[2*
a^2*d*f*h*(m + 1) - 2*a*b*(m + 1)*(d*f*g + d*e*h + c*f*h) + b^2*(2*m + 3)*(
d*e*g + c*f*g + c*e*h) - 2*b*(a*d*f*h*(m + 1) - b*(m + 2)*(d*f*g + d*e*h +
c*f*h))*x + d*f*h*(2*m + 5)*b^2*x^2, x], x] /; FreeQ[{a, b, c, d, e, f,
g, h}, x] && IntegerQ[2*m] && LeQ[m, -2]
```

Rule 1604

```
Int[(((a_.) + (b_.)*(x_))^(m_)*((A_.) + (B_.)*(x_) + (C_.)*(x_)^2))/(Sqrt[(
c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Sy
mbol] :> Simp[((A*b^2 - a*b*B + a^2*C)*(a + b*x)^(m + 1)*Sqrt[c + d*x]*Sqrt
[e + f*x]*Sqrt[g + h*x])/((m + 1)*(b*c - a*d)*(b*e - a*f)*(b*g - a*h)), x]
- Dist[1/(2*(m + 1)*(b*c - a*d)*(b*e - a*f)*(b*g - a*h)), Int[((a + b*x)^(m
+ 1)/(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]))*Simp[A*(2*a^2*d*f*h*(m +
1) - 2*a*b*(m + 1)*(d*f*g + d*e*h + c*f*h) + b^2*(2*m + 3)*(d*e*g + c*f*g
+ c*e*h)) - (b*B - a*C)*(a*(d*e*g + c*f*g + c*e*h) + 2*b*c*e*g*(m + 1)) - 2
*((A*b - a*B)*(a*d*f*h*(m + 1) - b*(m + 2)*(d*f*g + d*e*h + c*f*h)) - C*(a^
2*(d*f*g + d*e*h + c*f*h) - b^2*c*e*g*(m + 1) + a*b*(m + 1)*(d*e*g + c*f*g
+ c*e*h))*x + d*f*h*(2*m + 5)*(A*b^2 - a*b*B + a^2*C)*x^2, x], x] /; F
reeQ[{a, b, c, d, e, f, g, h, A, B, C}, x] && IntegerQ[2*m] && LtQ[m, -1]
```

Rule 1607

```
Int[(Px_)*((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f
_.)*(x_))^(p_.)*((g_.) + (h_.)*(x_))^(q_.), x_Symbol] :> Dist[PolynomialRem
ainder[Px, a + b*x, x], Int[(a + b*x)^m*(c + d*x)^n*(e + f*x)^p*(g + h*x)^q
, x], x] + Int[PolynomialQuotient[Px, a + b*x, x]*(a + b*x)^(m + 1)*(c + d*
x)^n*(e + f*x)^p*(g + h*x)^q, x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n, p,
q}, x] && PolyQ[Px, x] && EqQ[m, -1]
```

Rule 168

```
Int[1/(((a_.) + (b_.)*(x_))*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_
)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] :> Dist[-2, Subst[Int[1/(Simp[b*c -
a*d - b*x^2, x]*Sqrt[Simp[(d*e - c*f)/d + (f*x^2)/d, x]]*Sqrt[Simp[(d*g -
c*h)/d + (h*x^2)/d, x]]), x], x, Sqrt[c + d*x]], x] /; FreeQ[{a, b, c, d, e
, f, g, h}, x] && GtQ[(d*e - c*f)/d, 0]
```

Rule 538

```
Int[1/(((a_) + (b_.)*(x_)^2)*Sqrt[(c_) + (d_.)*(x_)^2]*Sqrt[(e_) + (f_.)*(x
_)^2]), x_Symbol] :> Dist[Sqrt[1 + (d*x^2)/c]/Sqrt[c + d*x^2], Int[1/((a +
b*x^2)*Sqrt[1 + (d*x^2)/c]*Sqrt[e + f*x^2]), x], x] /; FreeQ[{a, b, c, d, e
```

, f}, x] && !GtQ[c, 0]

Rule 537

Int[1/(((a_) + (b_)*(x_)^2)*Sqrt[(c_) + (d_)*(x_)^2]*Sqrt[(e_) + (f_)*(x_)^2]), x_Symbol] :> Simp[(1*EllipticPi[(b*c)/(a*d), ArcSin[Rt[-(d/c), 2]*x], (c*f)/(d*e))]/(a*Sqrt[c]*Sqrt[e]*Rt[-(d/c), 2]), x] /; FreeQ[{a, b, c, d, e, f}, x] && !GtQ[d/c, 0] && GtQ[c, 0] && GtQ[e, 0] && !(!GtQ[f/e, 0] && SimplersqrtQ[-(f/e), -(d/c)])

Rule 158

Int[((g_) + (h_)*(x_))/(Sqrt[(a_) + (b_)*(x_)]*Sqrt[(c_) + (d_)*(x_)]*Sqrt[(e_) + (f_)*(x_)]), x_Symbol] :> Dist[h/f, Int[Sqrt[e + f*x]/(Sqrt[a + b*x]*Sqrt[c + d*x]), x], x] + Dist[(f*g - e*h)/f, Int[1/(Sqrt[a + b*x]*Sqrt[c + d*x]*Sqrt[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x] && SimplersqrtQ[a + b*x, e + f*x] && SimplersqrtQ[c + d*x, e + f*x]

Rule 114

Int[Sqrt[(e_) + (f_)*(x_)]/(Sqrt[(a_) + (b_)*(x_)]*Sqrt[(c_) + (d_)*(x_)]), x_Symbol] :> Dist[(Sqrt[e + f*x]*Sqrt[(b*(c + d*x))/(b*c - a*d)])/(Sqrt[c + d*x]*Sqrt[(b*(e + f*x))/(b*e - a*f)]), Int[Sqrt[(b*e)/(b*e - a*f) + (b*f*x)/(b*e - a*f)]/(Sqrt[a + b*x]*Sqrt[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && !(GtQ[b/(b*c - a*d), 0] && GtQ[b/(b*e - a*f), 0]) && !LtQ[-((b*c - a*d)/d), 0]

Rule 113

Int[Sqrt[(e_) + (f_)*(x_)]/(Sqrt[(a_) + (b_)*(x_)]*Sqrt[(c_) + (d_)*(x_)]), x_Symbol] :> Simp[(2*Rt[-((b*e - a*f)/d), 2]*EllipticE[ArcSin[Sqrt[a + b*x]/Rt[-((b*c - a*d)/d), 2]], (f*(b*c - a*d))/(d*(b*e - a*f))]/b, x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[b/(b*c - a*d), 0] && GtQ[b/(b*e - a*f), 0] && !LtQ[-((b*c - a*d)/d), 0] && !(SimplersqrtQ[c + d*x, a + b*x] && GtQ[-(d/(b*c - a*d)), 0] && GtQ[d/(d*e - c*f), 0] && !LtQ[(b*c - a*d)/b, 0])

Rule 121

Int[1/(Sqrt[(a_) + (b_)*(x_)]*Sqrt[(c_) + (d_)*(x_)]*Sqrt[(e_) + (f_)*(x_)]), x_Symbol] :> Dist[Sqrt[(b*(c + d*x))/(b*c - a*d)]/Sqrt[c + d*x], Int[1/(Sqrt[a + b*x]*Sqrt[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)]*Sqrt[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && !GtQ[(b*c - a*d)/b, 0] && SimplersqrtQ[a + b*x, c + d*x] && SimplersqrtQ[a + b*x, e + f*x]

Rule 119

```

Int[1/(Sqrt[(a_) + (b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x_)]), x_Symbol] :> Simp[(2*Rt[-(b/d), 2]*EllipticF[ArcSin[Sqrt[a + b*x]/(Rt[-(b/d), 2]*Sqrt[(b*c - a*d)/b])], (f*(b*c - a*d))/(d*(b*e - a*f)))]/(b*Sqrt[(b*e - a*f)/b]), x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[(b*c - a*d)/b, 0] && GtQ[(b*e - a*f)/b, 0] && PosQ[-(b/d)] && !(SimplerQ[c + d*x, a + b*x] && GtQ[(d*e - c*f)/d, 0] && GtQ[-(d/b), 0]) && !(SimplerQ[c + d*x, a + b*x] && GtQ[(-(b*e) + a*f)/f, 0] && GtQ[-(f/b), 0]) && !(SimplerQ[e + f*x, a + b*x] && GtQ[(-(d*e) + c*f)/f, 0] && GtQ[(-(b*e) + a*f)/f, 0] && (PosQ[-(f/d)] || PosQ[-(f/b)]))

```

Rubi steps

$$\begin{aligned}
\int \frac{1}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^3} dx &= -\frac{25\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{55614(7+5x)^2} + \frac{\int \frac{16079-6860x+600x^2}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^2} dx}{111228} \\
&= -\frac{25\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{55614(7+5x)^2} - \frac{223825\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{1030972332(7+5x)} + \int \frac{1}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^3} dx \\
&= -\frac{25\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{55614(7+5x)^2} - \frac{223825\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{1030972332(7+5x)} + \int \frac{1}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^3} dx \\
&= -\frac{25\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{55614(7+5x)^2} - \frac{223825\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{1030972332(7+5x)} - \frac{447}{1030972332} + \int \frac{1}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^3} dx \\
&= -\frac{25\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{55614(7+5x)^2} - \frac{223825\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{1030972332(7+5x)} - \frac{447}{1030972332} + \int \frac{1}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^3} dx \\
&= -\frac{25\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{55614(7+5x)^2} - \frac{223825\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{1030972332(7+5x)} + \frac{447}{1030972332} + \int \frac{1}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^3} dx
\end{aligned}$$

Mathematica [A] time = 0.438753, size = 147, normalized size = 0.65

$$\frac{-\sqrt{55-22x}(5x+7)^2 \left(61059460E \left(\sin^{-1} \left(\frac{2\sqrt{2-3x}}{\sqrt{11}} \right) \middle| -\frac{1}{2} \right) - 3 \left(38699284\text{EllipticF} \left(\sin^{-1} \left(\frac{2\sqrt{2-3x}}{\sqrt{11}} \right), -\frac{1}{2} \right) + 48493305\Pi \left(\frac{703123130424\sqrt{2x-5}(5x+7)^2}{\dots} \right) \right) \right)}{703123130424\sqrt{2x-5}(5x+7)^2}$$

Antiderivative was successfully verified.

[In] Integrate[1/(Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(7 + 5*x)^3), x]

[Out] (-17050*Sqrt[2 - 3*x]*(-5 + 2*x)*Sqrt[1 + 4*x]*(81209 + 44765*x) - Sqrt[55 - 22*x]*(7 + 5*x)^2*(61059460*EllipticE[ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2] - 3*(38699284*EllipticF[ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2] + 48493305*EllipticPi[55/124, -ArcSin[(2*Sqrt[2 - 3*x])/Sqrt[11]], -1/2])))/(703123130424*Sqrt[-5 + 2*x]*(7 + 5*x)^2)

Maple [B] time = 0.02, size = 461, normalized size = 2.1

$$\frac{1}{(16874955130176x^3 - 49218619129680x^2 + 14765585738904x + 7031231304240)(7 + 5x)^2 \sqrt{2 - 3x} \sqrt{2x - 5} \sqrt{4x + 1}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(1/(7+5*x)^3/(2-3*x)^(1/2)/(2*x-5)^(1/2)/(4*x+1)^(1/2), x)

[Out] -1/703123130424*(2-3*x)^(1/2)*(2*x-5)^(1/2)*(4*x+1)^(1/2)*(2902446300*11^(1/2)*(2-3*x)^(1/2)*(5-2*x)^(1/2)*(4*x+1)^(1/2)*EllipticF(2/11*(22-33*x)^(1/2), 1/2*I*2^(1/2))*x^2-1526486500*11^(1/2)*(2-3*x)^(1/2)*(5-2*x)^(1/2)*(4*x+1)^(1/2)*EllipticE(2/11*(22-33*x)^(1/2), 1/2*I*2^(1/2))*x^2-3636997875*11^(1/2)*(2-3*x)^(1/2)*(5-2*x)^(1/2)*(4*x+1)^(1/2)*EllipticPi(2/11*(22-33*x)^(1/2), 55/124, 1/2*I*2^(1/2))*x^2+8126849640*11^(1/2)*(2-3*x)^(1/2)*(5-2*x)^(1/2)*(4*x+1)^(1/2)*EllipticF(2/11*(22-33*x)^(1/2), 1/2*I*2^(1/2))*x-4274162200*11^(1/2)*(2-3*x)^(1/2)*(5-2*x)^(1/2)*(4*x+1)^(1/2)*EllipticE(2/11*(22-33*x)^(1/2), 1/2*I*2^(1/2))*x-10183594050*11^(1/2)*(2-3*x)^(1/2)*(5-2*x)^(1/2)*(4*x+1)^(1/2)*EllipticPi(2/11*(22-33*x)^(1/2), 55/124, 1/2*I*2^(1/2))*x+5688794748*11^(1/2)*(2-3*x)^(1/2)*(5-2*x)^(1/2)*(4*x+1)^(1/2)*EllipticF(2/11*(22-33*x)^(1/2), 1/2*I*2^(1/2))-2991913540*11^(1/2)*(2-3*x)^(1/2)*(5-2*x)^(1/2)*(4*x+1)^(1/2)*EllipticE(2/11*(22-33*x)^(1/2), 1/2*I*2^(1/2))-7128515835*11^(1/2)*(2-3*x)^(1/2)*(5-2*x)^(1/2)*(4*x+1)^(1/2)*EllipticPi(2/11*(22-33*x)^(1/2), 55/124, 1/2*I*2^(1/2))+18317838000*x^4-20196304700*x^3-80894833250*x^2+36709314950*x+13846134500)/(24*x^3-70*x^2+21*x+10)/(7+5*x)^2

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(5x+7)^3 \sqrt{4x+1} \sqrt{2x-5} \sqrt{-3x+2}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(7+5*x)^3/(2-3*x)^(1/2)/(-5+2*x)^(1/2)/(1+4*x)^(1/2),x, algorithm="maxima")

[Out] integrate(1/((5*x + 7)^3*sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)), x)

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2}}{3000x^6 + 3850x^5 - 16485x^4 - 30943x^3 - 3325x^2 + 14553x + 3430}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(7+5*x)^3/(2-3*x)^(1/2)/(-5+2*x)^(1/2)/(1+4*x)^(1/2),x, algorithm="fricas")

[Out] integral(-sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)/(3000*x^6 + 3850*x^5 - 16485*x^4 - 30943*x^3 - 3325*x^2 + 14553*x + 3430), x)

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(7+5*x)**3/(2-3*x)**(1/2)/(-5+2*x)**(1/2)/(1+4*x)**(1/2),x)

[Out] Exception raised: ValueError

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(5x+7)^3 \sqrt{4x+1} \sqrt{2x-5} \sqrt{-3x+2}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(7+5*x)^3/(2-3*x)^(1/2)/(-5+2*x)^(1/2)/(1+4*x)^(1/2),x, algorithm="giac")

```
[Out] integrate(1/((5*x + 7)^3*sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)), x)
```

$$3.68 \quad \int \frac{ci+dx}{\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}} dx$$

Optimal. Leaf size=137

$$\frac{2i\sqrt{c+dx}\sqrt{eh-fg}\sqrt{\frac{f(g+hx)}{fg-eh}}E\left(\sin^{-1}\left(\frac{\sqrt{h}\sqrt{e+fx}}{\sqrt{eh-fg}}\right)\middle|-\frac{d(fg-eh)}{(de-cf)h}\right)}{f\sqrt{h}\sqrt{g+hx}\sqrt{-\frac{f(c+dx)}{de-cf}}}$$

[Out] (2*Sqrt[-(f*g) + e*h]*i*Sqrt[c + d*x]*Sqrt[(f*(g + h*x))/(f*g - e*h)]*EllipticE[ArcSin[(Sqrt[h]*Sqrt[e + f*x])/Sqrt[-(f*g) + e*h]], -(d*(f*g - e*h))/((d*e - c*f)*h)])/(f*Sqrt[h]*Sqrt[-((f*(c + d*x))/(d*e - c*f))]*Sqrt[g + h*x])

Rubi [A] time = 0.0612999, antiderivative size = 137, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 36, $\frac{\text{number of rules}}{\text{integrand size}} = 0.083$, Rules used = {21, 114, 113}

$$\frac{2i\sqrt{c+dx}\sqrt{eh-fg}\sqrt{\frac{f(g+hx)}{fg-eh}}E\left(\sin^{-1}\left(\frac{\sqrt{h}\sqrt{e+fx}}{\sqrt{eh-fg}}\right)\middle|-\frac{d(fg-eh)}{(de-cf)h}\right)}{f\sqrt{h}\sqrt{g+hx}\sqrt{-\frac{f(c+dx)}{de-cf}}}$$

Antiderivative was successfully verified.

[In] Int[(c*i + d*i*x)/(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]),x]

[Out] (2*Sqrt[-(f*g) + e*h]*i*Sqrt[c + d*x]*Sqrt[(f*(g + h*x))/(f*g - e*h)]*EllipticE[ArcSin[(Sqrt[h]*Sqrt[e + f*x])/Sqrt[-(f*g) + e*h]], -(d*(f*g - e*h))/((d*e - c*f)*h)])/(f*Sqrt[h]*Sqrt[-((f*(c + d*x))/(d*e - c*f))]*Sqrt[g + h*x])

Rule 21

Int[(u_.)*((a_) + (b_.)*(v_))^(m_.)*((c_) + (d_.)*(v_))^(n_.), x_Symbol] :> Dist[(b/d)^m, Int[u*(c + d*v)^(m + n), x], x] /; FreeQ[{a, b, c, d, n}, x] && EqQ[b*c - a*d, 0] && IntegerQ[m] && (!IntegerQ[n] || SimplerQ[c + d*x, a + b*x])

Rule 114

```
Int[Sqrt[(e_.) + (f_.)*(x_)]/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]), x_Symbol] := Dist[(Sqrt[e + f*x]*Sqrt[(b*(c + d*x))/(b*c - a*d)])/(Sqrt[c + d*x]*Sqrt[(b*(e + f*x))/(b*e - a*f)])], Int[Sqrt[(b*e)/(b*e - a*f) + (b*f*x)/(b*e - a*f)]/(Sqrt[a + b*x]*Sqrt[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)])], x], x] /; FreeQ[{a, b, c, d, e, f}, x] && !(GtQ[b/(b*c - a*d), 0] && GtQ[b/(b*e - a*f), 0]) && !LtQ[-((b*c - a*d)/d), 0]
```

Rule 113

```
Int[Sqrt[(e_.) + (f_.)*(x_)]/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]), x_Symbol] := Simp[(2*Rt[-((b*e - a*f)/d), 2]*EllipticE[ArcSin[Sqrt[a + b*x]/Rt[-((b*c - a*d)/d), 2]], (f*(b*c - a*d))/(d*(b*e - a*f))]/b, x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[b/(b*c - a*d), 0] && GtQ[b/(b*e - a*f), 0] && !LtQ[-((b*c - a*d)/d), 0] && !(SimplerQ[c + d*x, a + b*x] && GtQ[-(d/(b*c - a*d)), 0] && GtQ[d/(d*e - c*f), 0] && !LtQ[(b*c - a*d)/b, 0])
```

Rubi steps

$$\int \frac{68c + 68dx}{\sqrt{c + dx}\sqrt{e + fx}\sqrt{g + hx}} dx = 68 \int \frac{\sqrt{c + dx}}{\sqrt{e + fx}\sqrt{g + hx}} dx$$

$$= \frac{\left(68\sqrt{c + dx}\sqrt{\frac{f(g+hx)}{fg-eh}}\right) \int \frac{\sqrt{\frac{cf}{-de+cf} + \frac{dfx}{-de+cf}}}{\sqrt{e+fx}\sqrt{\frac{fg}{fg-eh} + \frac{fhx}{fg-eh}}} dx}{\sqrt{\frac{f(c+dx)}{-de+cf}}\sqrt{g + hx}}$$

$$= \frac{136\sqrt{-fg + eh}\sqrt{c + dx}\sqrt{\frac{f(g+hx)}{fg-eh}} E\left(\sin^{-1}\left(\frac{\sqrt{h}\sqrt{e+fx}}{\sqrt{-fg+eh}}\right) \mid -\frac{d(fg-eh)}{(de-cf)h}\right)}{f\sqrt{h}\sqrt{-\frac{f(c+dx)}{de-cf}}\sqrt{g + hx}}$$

Mathematica [C] time = 0.586411, size = 180, normalized size = 1.31

$$\frac{2ii\sqrt{c + dx}\sqrt{g + hx} \left(E\left(i \sinh^{-1}\left(\sqrt{\frac{f(c+dx)}{de-cf}}\right) \mid \frac{deh-cfh}{dfg-cfh}\right) - \text{EllipticF}\left(i \sinh^{-1}\left(\sqrt{\frac{f(c+dx)}{de-cf}}\right), \frac{deh-cfh}{dfg-cfh}\right) \right)}{h\sqrt{e + fx}\sqrt{\frac{f(c+dx)}{d(e+fx)}}\sqrt{\frac{d(g+hx)}{dg-ch}}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c*i + d*i*x)/(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]), x]
```

```
[Out] ((-2*I)*i*Sqrt[c + d*x]*Sqrt[g + h*x]*(EllipticE[I*ArcSinh[Sqrt[(f*(c + d*x))]/(d*e - c*f)]], (d*e*h - c*f*h)/(d*f*g - c*f*h)] - EllipticF[I*ArcSinh[Sqrt[(f*(c + d*x))/(d*e - c*f)]], (d*e*h - c*f*h)/(d*f*g - c*f*h)]))/(h*Sqrt[(f*(c + d*x))/(d*(e + f*x))]*Sqrt[e + f*x]*Sqrt[(d*(g + h*x))/(d*g - c*h)])
```

Maple [B] time = 0.022, size = 552, normalized size = 4.

$$2 \frac{i\sqrt{dx+c}\sqrt{fx+e}\sqrt{hx+g}}{dfh(dfhx^3 + cfhx^2 + dehx^2 + dfgx^2 + celx + cfgx + degx + ceg)} \left(\text{EllipticF} \left(\sqrt{\frac{(dx+c)f}{cf-de}}, \sqrt{\frac{(cf-de)h}{f(ch-dg)}} \right) c^2 fh - \dots \right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)/(d*x+c)^(1/2)/(f*x+e)^(1/2)/(h*x+g)^(1/2),x)
```

```
[Out] 2*i*(EllipticF(((d*x+c)*f/(c*f-d*e))^(1/2),((c*f-d*e)*h/f/(c*h-d*g))^(1/2))
*c^2*f*h-EllipticF(((d*x+c)*f/(c*f-d*e))^(1/2),((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*c*d*e*h-EllipticF(((d*x+c)*f/(c*f-d*e))^(1/2),((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*c*d*f*g+EllipticF(((d*x+c)*f/(c*f-d*e))^(1/2),((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*d^2*e*g-EllipticE(((d*x+c)*f/(c*f-d*e))^(1/2),((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*c^2*f*h+EllipticE(((d*x+c)*f/(c*f-d*e))^(1/2),((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*c*d*e*h+EllipticE(((d*x+c)*f/(c*f-d*e))^(1/2),((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*c*d*f*g-EllipticE(((d*x+c)*f/(c*f-d*e))^(1/2),((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*d^2*e*g)/d*(-(f*x+e)*d/(c*f-d*e))^(1/2)*(-(h*x+g)*d/(c*h-d*g))^(1/2)*((d*x+c)*f/(c*f-d*e))^(1/2)/h/f*(d*x+c)^(1/2)*(f*x+e)^(1/2)*(h*x+g)^(1/2)/(d*f*h*x^3+c*f*h*x^2+d*e*h*x^2+d*f*g*x^2+c*e*h*x+c*f*g*x+d*e*g*x+c*e*g)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{dix + ci}{\sqrt{dx+c}\sqrt{fx+e}\sqrt{hx+g}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)/(d*x+c)^(1/2)/(f*x+e)^(1/2)/(h*x+g)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate((d*i*x + c*i)/(sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{dx+c}\sqrt{fx+e}\sqrt{hx+g}}{fhx^2+eg+(fg+eh)x}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d*i*x+c*i)/(d*x+c)^(1/2)/(f*x+e)^(1/2)/(h*x+g)^(1/2),x, algorithm="fricas")

[Out] integral(sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)*i/(f*h*x^2 + e*g + (f*g + e*h)*x), x)

Sympy [F] time = 0., size = 0, normalized size = 0.

$$i \int \frac{\sqrt{c+dx}}{\sqrt{e+fx}\sqrt{g+hx}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d*i*x+c*i)/(d*x+c)**(1/2)/(f*x+e)**(1/2)/(h*x+g)**(1/2),x)

[Out] i*Integral(sqrt(c + d*x)/(sqrt(e + f*x)*sqrt(g + h*x)), x)

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{dix+ci}{\sqrt{dx+c}\sqrt{fx+e}\sqrt{hx+g}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d*i*x+c*i)/(d*x+c)^(1/2)/(f*x+e)^(1/2)/(h*x+g)^(1/2),x, algorithm="giac")

[Out] integrate((d*i*x + c*i)/(sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)), x)

$$3.69 \quad \int \frac{a+bx}{\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}} dx$$

Optimal. Leaf size=284

$$\frac{2b\sqrt{g+hx}\sqrt{cf-de}\sqrt{\frac{d(e+fx)}{de-cf}}E\left(\sin^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{cf-de}}\right)\middle|\frac{(de-cf)h}{f(dg-ch)}\right)}{d\sqrt{fh}\sqrt{e+fx}\sqrt{\frac{d(g+hx)}{dg-ch}}} - \frac{2(bg-ah)\sqrt{cf-de}\sqrt{\frac{d(e+fx)}{de-cf}}\sqrt{\frac{d(g+hx)}{dg-ch}}\text{EllipticF}\left(\sin^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{cf-de}}\right)\middle|\frac{(de-cf)h}{f(dg-ch)}\right)}{d\sqrt{fh}\sqrt{e+fx}\sqrt{g+hx}}$$

```
[Out] (2*b*Sqrt[-(d*e) + c*f]*Sqrt[(d*(e + f*x))/(d*e - c*f])*Sqrt[g + h*x]*EllipticE[ArcSin[(Sqrt[f]*Sqrt[c + d*x])/Sqrt[-(d*e) + c*f]], ((d*e - c*f)*h)/(f*(d*g - c*h))]/(d*Sqrt[f]*h*Sqrt[e + f*x]*Sqrt[(d*(g + h*x))/(d*g - c*h)]) - (2*Sqrt[-(d*e) + c*f]*(b*g - a*h)*Sqrt[(d*(e + f*x))/(d*e - c*f])*Sqrt[(d*(g + h*x))/(d*g - c*h)]*EllipticF[ArcSin[(Sqrt[f]*Sqrt[c + d*x])/Sqrt[-(d*e) + c*f]], ((d*e - c*f)*h)/(f*(d*g - c*h)))]/(d*Sqrt[f]*h*Sqrt[e + f*x]*Sqrt[g + h*x])
```

Rubi [A] time = 0.168916, antiderivative size = 284, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}} = 0.152$, Rules used = {158, 114, 113, 121, 120}

$$\frac{2b\sqrt{g+hx}\sqrt{cf-de}\sqrt{\frac{d(e+fx)}{de-cf}}E\left(\sin^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{cf-de}}\right)\middle|\frac{(de-cf)h}{f(dg-ch)}\right)}{d\sqrt{fh}\sqrt{e+fx}\sqrt{\frac{d(g+hx)}{dg-ch}}} - \frac{2(bg-ah)\sqrt{cf-de}\sqrt{\frac{d(e+fx)}{de-cf}}\sqrt{\frac{d(g+hx)}{dg-ch}}F\left(\sin^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{cf-de}}\right)\middle|\frac{(de-cf)h}{f(dg-ch)}\right)}{d\sqrt{fh}\sqrt{e+fx}\sqrt{g+hx}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x)/(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]),x]
```

```
[Out] (2*b*Sqrt[-(d*e) + c*f]*Sqrt[(d*(e + f*x))/(d*e - c*f])*Sqrt[g + h*x]*EllipticE[ArcSin[(Sqrt[f]*Sqrt[c + d*x])/Sqrt[-(d*e) + c*f]], ((d*e - c*f)*h)/(f*(d*g - c*h))]/(d*Sqrt[f]*h*Sqrt[e + f*x]*Sqrt[(d*(g + h*x))/(d*g - c*h)]) - (2*Sqrt[-(d*e) + c*f]*(b*g - a*h)*Sqrt[(d*(e + f*x))/(d*e - c*f])*Sqrt[(d*(g + h*x))/(d*g - c*h)]*EllipticF[ArcSin[(Sqrt[f]*Sqrt[c + d*x])/Sqrt[-(d*e) + c*f]], ((d*e - c*f)*h)/(f*(d*g - c*h)))]/(d*Sqrt[f]*h*Sqrt[e + f*x]*Sqrt[g + h*x])
```

Rule 158

```
Int[((g_.) + (h_.)*(x_))/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]*
Sqrt[(e_.) + (f_.)*(x_)]), x_Symbol] := Dist[h/f, Int[Sqrt[e + f*x]/(Sqrt[a
+ b*x]*Sqrt[c + d*x]), x], x] + Dist[(f*g - e*h)/f, Int[1/(Sqrt[a + b*x]*Sq
rt[c + d*x]*Sqrt[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x] &&
SimplerQ[a + b*x, e + f*x] && SimplerQ[c + d*x, e + f*x]
```

Rule 114

```
Int[Sqrt[(e_.) + (f_.)*(x_)]/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_
)]), x_Symbol] := Dist[(Sqrt[e + f*x]*Sqrt[(b*(c + d*x))/(b*c - a*d)])/(Sqr
t[c + d*x]*Sqrt[(b*(e + f*x))/(b*e - a*f)]), Int[Sqrt[(b*e)/(b*e - a*f)] + (
b*f*x)/(b*e - a*f)]/(Sqrt[a + b*x]*Sqrt[(b*c)/(b*c - a*d) + (b*d*x)/(b*c -
a*d)]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && !(GtQ[b/(b*c - a*d), 0]
&& GtQ[b/(b*e - a*f), 0]) && !LtQ[-((b*c - a*d)/d), 0]
```

Rule 113

```
Int[Sqrt[(e_.) + (f_.)*(x_)]/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_
)]), x_Symbol] := Simp[(2*Rt[-((b*e - a*f)/d), 2]*EllipticE[ArcSin[Sqrt[a +
b*x]/Rt[-((b*c - a*d)/d), 2]], (f*(b*c - a*d))/(d*(b*e - a*f))]/b, x] /;
FreeQ[{a, b, c, d, e, f}, x] && GtQ[b/(b*c - a*d), 0] && GtQ[b/(b*e - a*f),
0] && !LtQ[-((b*c - a*d)/d), 0] && !(SimplerQ[c + d*x, a + b*x] && GtQ[-
(d/(b*c - a*d)), 0] && GtQ[d/(d*e - c*f), 0] && !LtQ[(b*c - a*d)/b, 0])
```

Rule 121

```
Int[1/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x
_)]), x_Symbol] := Dist[Sqrt[(b*(c + d*x))/(b*c - a*d)]/Sqrt[c + d*x], Int[
1/(Sqrt[a + b*x]*Sqrt[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)]*Sqrt[e + f*x
]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && !GtQ[(b*c - a*d)/b, 0] && Si
mplerQ[a + b*x, c + d*x] && SimplerQ[a + b*x, e + f*x]
```

Rule 120

```
Int[1/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x
_)]), x_Symbol] := Simp[(2*Rt[-(b/d), 2]*EllipticF[ArcSin[Sqrt[a + b*x]/(Rt
[-(b/d), 2]*Sqrt[(b*c - a*d)/b])], (f*(b*c - a*d))/(d*(b*e - a*f)))]/(b*Sqr
t[(b*e - a*f)/b]), x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[b/(b*c - a*d),
0] && GtQ[b/(b*e - a*f), 0] && SimplerQ[a + b*x, c + d*x] && SimplerQ[a +
b*x, e + f*x] && (PosQ[-((b*c - a*d)/d)] || NegQ[-((b*e - a*f)/f)])
```

Rubi steps

$$\begin{aligned}
\int \frac{a + bx}{\sqrt{c + dx}\sqrt{e + fx}\sqrt{g + hx}} dx &= \frac{b \int \frac{\sqrt{g+hx}}{\sqrt{c+dx}\sqrt{e+fx}} dx}{h} + \frac{(-bg + ah) \int \frac{1}{\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}} dx}{h} \\
&= \frac{\left((-bg + ah)\sqrt{\frac{d(e+fx)}{de-cf}}\right) \int \frac{1}{\sqrt{c+dx}\sqrt{\frac{de}{de-cf} + \frac{dfx}{de-cf}}\sqrt{g+hx}} dx}{h\sqrt{e + fx}} + \frac{\left(b\sqrt{\frac{d(e+fx)}{de-cf}}\sqrt{g + hx}\right) \int \frac{\sqrt{\frac{dg}{dg-c}}}{\sqrt{c+dx}\sqrt{\frac{dg}{dg-c}}} dx}{h\sqrt{e + fx}\sqrt{\frac{d(g+hx)}{dg-ch}}} \\
&= \frac{2b\sqrt{-de + cf}\sqrt{\frac{d(e+fx)}{de-cf}}\sqrt{g + hx}E\left(\sin^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{-de+cf}}\right)\middle|\frac{(de-cf)h}{f(dg-ch)}\right)}{d\sqrt{f}h\sqrt{e + fx}\sqrt{\frac{d(g+hx)}{dg-ch}}} + \frac{\left((-bg + ah)\sqrt{\frac{d(e+fx)}{de-cf}}\sqrt{g + hx}\right) \int \frac{\sqrt{\frac{dg}{dg-c}}}{\sqrt{c+dx}\sqrt{\frac{dg}{dg-c}}} dx}{h\sqrt{e + fx}\sqrt{\frac{d(g+hx)}{dg-ch}}} \\
&= \frac{2b\sqrt{-de + cf}\sqrt{\frac{d(e+fx)}{de-cf}}\sqrt{g + hx}E\left(\sin^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{-de+cf}}\right)\middle|\frac{(de-cf)h}{f(dg-ch)}\right)}{d\sqrt{f}h\sqrt{e + fx}\sqrt{\frac{d(g+hx)}{dg-ch}}} - \frac{2\sqrt{-de + cf}(bg - ah)\sqrt{\frac{d(g+hx)}{dg-ch}}}{d\sqrt{f}h\sqrt{e + fx}\sqrt{\frac{d(g+hx)}{dg-ch}}}
\end{aligned}$$

Mathematica [C] time = 1.91082, size = 319, normalized size = 1.12

$$\frac{2 \left(idh(c + dx)^{3/2}(be - af)\sqrt{\frac{d(e+fx)}{f(c+dx)}}\sqrt{\frac{d(g+hx)}{h(c+dx)}} \text{EllipticF}\left(i \sinh^{-1}\left(\frac{\sqrt{\frac{de}{f}} - c}{\sqrt{c+dx}}\right), \frac{dfg - cfh}{deh - cfh}\right) - bd^2(e + fx)(g + hx)\sqrt{\frac{de}{f} - c} - ibh\sqrt{\frac{de}{f} - c} \right)}{d^2fh\sqrt{c + dx}\sqrt{e + fx}\sqrt{g + hx}\sqrt{\frac{de}{f} - c}}$$

Antiderivative was successfully verified.

[In] Integrate[(a + b*x)/(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]),x]

[Out] $(-2*(-(b*d^2*\text{Sqrt}[-c + (d*e)/f])*(e + f*x)*(g + h*x)) - I*b*(d*e - c*f)*h*(c + d*x)^{(3/2)}*\text{Sqrt}[(d*(e + f*x))/(f*(c + d*x))]*\text{Sqrt}[(d*(g + h*x))/(h*(c + d*x))])* \text{EllipticE}[I*\text{ArcSinh}[\text{Sqrt}[-c + (d*e)/f]/\text{Sqrt}[c + d*x]], (d*f*g - c*f*h)/(d*e*h - c*f*h)] + I*d*(b*e - a*f)*h*(c + d*x)^{(3/2)}*\text{Sqrt}[(d*(e + f*x))/(f*(c + d*x))]*\text{Sqrt}[(d*(g + h*x))/(h*(c + d*x))]* \text{EllipticF}[I*\text{ArcSinh}[\text{Sqrt}[-c + (d*e)/f]/\text{Sqrt}[c + d*x]], (d*f*g - c*f*h)/(d*e*h - c*f*h)))/(d^2*\text{Sqrt}[-c + (d*e)/f]*f*h*\text{Sqrt}[c + d*x]*\text{Sqrt}[e + f*x]*\text{Sqrt}[g + h*x])$

Maple [B] time = 0.033, size = 559, normalized size = 2.

$$2 \frac{\sqrt{dx+c}\sqrt{fx+e}\sqrt{hx+g}}{d^2fh(dfhx^3 + cfhx^2 + dehx^2 + dfgx^2 + celx + cf gx + degx + ceg)} \left(\text{EllipticF} \left(\sqrt{\frac{(dx+c)f}{cf-de}}, \sqrt{\frac{(cf-de)h}{f(ch-dg)}} \right) \right) acdfh -$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b*x+a)/(d*x+c)^(1/2)/(f*x+e)^(1/2)/(h*x+g)^(1/2), x)

[Out] 2*(EllipticF(((d*x+c)*f/(c*f-d*e))^(1/2), ((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*a *c*d*f*h-EllipticF(((d*x+c)*f/(c*f-d*e))^(1/2), ((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*a*d^2*e*h-EllipticF(((d*x+c)*f/(c*f-d*e))^(1/2), ((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*b*c*d*f*g+EllipticF(((d*x+c)*f/(c*f-d*e))^(1/2), ((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*b*d^2*e*g-EllipticE(((d*x+c)*f/(c*f-d*e))^(1/2), ((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*b*c^2*f*h+EllipticE(((d*x+c)*f/(c*f-d*e))^(1/2), ((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*b*c*d*e*h+EllipticE(((d*x+c)*f/(c*f-d*e))^(1/2), ((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*b*c*d*f*g-EllipticE(((d*x+c)*f/(c*f-d*e))^(1/2), ((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*b*d^2*e*g*(-(f*x+e)*d/(c*f-d*e))^(1/2)*(-(h*x+g)*d/(c*h-d*g))^(1/2)*((d*x+c)*f/(c*f-d*e))^(1/2)/h/f/d^2*(d*x+c)^(1/2)*(f*x+e)^(1/2)*(h*x+g)^(1/2)/(d*f*h*x^3+c*f*h*x^2+d*e*h*x^2+d*f*g*x^2+c*e*h*x+c*f*g*x+d*e*g*x+c*e*g)

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{bx+a}{\sqrt{dx+c}\sqrt{fx+e}\sqrt{hx+g}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b*x+a)/(d*x+c)^(1/2)/(f*x+e)^(1/2)/(h*x+g)^(1/2), x, algorithm="maxima")

[Out] integrate((b*x + a)/(sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)), x)

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral} \left(\frac{(bx+a)\sqrt{dx+c}\sqrt{fx+e}\sqrt{hx+g}}{dfhx^3 + ceg + (dfg + (de+cf)h)x^2 + (ceh + (de+cf)g)x}, x \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b*x+a)/(d*x+c)^(1/2)/(f*x+e)^(1/2)/(h*x+g)^(1/2),x, algorithm="fricas")

[Out] integral((b*x + a)*sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)/(d*f*h*x^3 + c*e*g + (d*f*g + (d*e + c*f)*h)*x^2 + (c*e*h + (d*e + c*f)*g)*x), x)

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{a + bx}{\sqrt{c + dx}\sqrt{e + fx}\sqrt{g + hx}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b*x+a)/(d*x+c)**(1/2)/(f*x+e)**(1/2)/(h*x+g)**(1/2),x)

[Out] Integral((a + b*x)/(sqrt(c + d*x)*sqrt(e + f*x)*sqrt(g + h*x)), x)

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{bx + a}{\sqrt{dx + c}\sqrt{fx + e}\sqrt{hx + g}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b*x+a)/(d*x+c)^(1/2)/(f*x+e)^(1/2)/(h*x+g)^(1/2),x, algorithm="giac")

[Out] integrate((b*x + a)/(sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)), x)

$$3.70 \quad \int \frac{1}{(a+bx)\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}} dx$$

Optimal. Leaf size=165

$$\frac{2\sqrt{cf-de}\sqrt{\frac{d(e+fx)}{de-cf}}\sqrt{\frac{d(g+hx)}{dg-ch}}\Pi\left(-\frac{b(de-cf)}{(bc-ad)f}; \sin^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{cf-de}}\right)\middle|_{f(dg-ch)}\right)}{\sqrt{f}\sqrt{e+fx}\sqrt{g+hx}(bc-ad)}$$

[Out] $(-2*\text{Sqrt}[-(d*e) + c*f]*\text{Sqrt}[(d*(e + f*x))/(d*e - c*f)]*\text{Sqrt}[(d*(g + h*x))/(d*g - c*h)]*\text{EllipticPi}[-((b*(d*e - c*f))/((b*c - a*d)*f)), \text{ArcSin}[(\text{Sqrt}[f]*\text{Sqrt}[c + d*x])/\text{Sqrt}[-(d*e) + c*f]], ((d*e - c*f)*h)/(f*(d*g - c*h))]/((b*c - a*d)*\text{Sqrt}[f]*\text{Sqrt}[e + f*x]*\text{Sqrt}[g + h*x])$

Rubi [A] time = 0.37394, antiderivative size = 165, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}} = 0.086$, Rules used = {169, 538, 537}

$$\frac{2\sqrt{cf-de}\sqrt{\frac{d(e+fx)}{de-cf}}\sqrt{\frac{d(g+hx)}{dg-ch}}\Pi\left(-\frac{b(de-cf)}{(bc-ad)f}; \sin^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{cf-de}}\right)\middle|_{f(dg-ch)}\right)}{\sqrt{f}\sqrt{e+fx}\sqrt{g+hx}(bc-ad)}$$

Antiderivative was successfully verified.

[In] $\text{Int}[1/((a + b*x)*\text{Sqrt}[c + d*x]*\text{Sqrt}[e + f*x]*\text{Sqrt}[g + h*x]), x]$

[Out] $(-2*\text{Sqrt}[-(d*e) + c*f]*\text{Sqrt}[(d*(e + f*x))/(d*e - c*f)]*\text{Sqrt}[(d*(g + h*x))/(d*g - c*h)]*\text{EllipticPi}[-((b*(d*e - c*f))/((b*c - a*d)*f)), \text{ArcSin}[(\text{Sqrt}[f]*\text{Sqrt}[c + d*x])/\text{Sqrt}[-(d*e) + c*f]], ((d*e - c*f)*h)/(f*(d*g - c*h))]/((b*c - a*d)*\text{Sqrt}[f]*\text{Sqrt}[e + f*x]*\text{Sqrt}[g + h*x])$

Rule 169

$\text{Int}[1/(((a_.) + (b_.)*(x_.))*\text{Sqrt}[(c_.) + (d_.)*(x_.)]*\text{Sqrt}[(e_.) + (f_.)*(x_.)]*\text{Sqrt}[(g_.) + (h_.)*(x_.)]), x_Symbol] \rightarrow \text{Dist}[-2, \text{Subst}[\text{Int}[1/(\text{Simp}[b*c - a*d - b*x^2, x]*\text{Sqrt}[\text{Simp}[(d*e - c*f)/d + (f*x^2)/d, x]]*\text{Sqrt}[\text{Simp}[(d*g - c*h)/d + (h*x^2)/d, x]]), x], x, \text{Sqrt}[c + d*x]], x] /; \text{FreeQ}\{a, b, c, d, e, f, g, h\}, x \&\& \text{!SimplerQ}[e + f*x, c + d*x] \&\& \text{!SimplerQ}[g + h*x, c + d*x]$

Rule 538

```
Int[1/(((a_) + (b_)*(x_)^2)*Sqrt[(c_) + (d_)*(x_)^2]*Sqrt[(e_) + (f_)*(x_)^2]), x_Symbol] := Dist[Sqrt[1 + (d*x^2)/c]/Sqrt[c + d*x^2], Int[1/((a + b*x^2)*Sqrt[1 + (d*x^2)/c]*Sqrt[e + f*x^2]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && !GtQ[c, 0]
```

Rule 537

```
Int[1/(((a_) + (b_)*(x_)^2)*Sqrt[(c_) + (d_)*(x_)^2]*Sqrt[(e_) + (f_)*(x_)^2]), x_Symbol] := Simp[(1*EllipticPi[(b*c)/(a*d), ArcSin[Rt[-(d/c), 2]*x], (c*f)/(d*e)]/(a*Sqrt[c]*Sqrt[e]*Rt[-(d/c), 2]), x] /; FreeQ[{a, b, c, d, e, f}, x] && !GtQ[d/c, 0] && GtQ[c, 0] && GtQ[e, 0] && !( !GtQ[f/e, 0] && SimplerSqrtQ[-(f/e), -(d/c)])
```

Rubi steps

$$\int \frac{1}{(a+bx)\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}} dx = - \left(2 \operatorname{Subst} \left(\int \frac{1}{(bc-ad-bx^2)\sqrt{e-\frac{cf}{d}+\frac{fx^2}{d}}\sqrt{g-\frac{ch}{d}+\frac{hx^2}{d}}} dx, x, \sqrt{c+dx} \right) \right)$$

$$= - \frac{\left(2\sqrt{\frac{d(e+fx)}{de-cf}} \operatorname{Subst} \left(\int \frac{1}{(bc-ad-bx^2)\sqrt{1+\frac{fx^2}{d\left(\frac{e-cf}{d}\right)}}\sqrt{g-\frac{ch}{d}+\frac{hx^2}{d}}} dx, x, \sqrt{c+dx} \right) \right)}{\sqrt{e+fx}}$$

$$= - \frac{\left(2\sqrt{\frac{d(e+fx)}{de-cf}}\sqrt{\frac{d(g+hx)}{dg-ch}} \operatorname{Subst} \left(\int \frac{1}{(bc-ad-bx^2)\sqrt{1+\frac{fx^2}{d\left(\frac{e-cf}{d}\right)}}\sqrt{1+\frac{hx^2}{d\left(\frac{g-ch}{d}\right)}}} dx, x, \sqrt{c+dx} \right) \right)}{\sqrt{e+fx}\sqrt{g+hx}}$$

$$= - \frac{2\sqrt{-de+cf}\sqrt{\frac{d(e+fx)}{de-cf}}\sqrt{\frac{d(g+hx)}{dg-ch}}\Pi\left(-\frac{b(de-cf)}{(bc-ad)f}; \sin^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{-de+cf}}\right), \frac{(de-cf)h}{f(dg-ch)}\right)}{(bc-ad)\sqrt{f}\sqrt{e+fx}\sqrt{g+hx}}$$

Mathematica [C] time = 1.36514, size = 225, normalized size = 1.36

$$\frac{2i(c+dx)\sqrt{\frac{d(e+fx)}{f(c+dx)}}\sqrt{\frac{d(g+hx)}{h(c+dx)}}\left(\operatorname{EllipticF}\left(i\sinh^{-1}\left(\frac{\sqrt{\frac{de}{f}-c}}{\sqrt{c+dx}}\right), \frac{dfg-cfh}{deh-cfh}\right) - \Pi\left(\frac{(bc-ad)f}{b(cf-de)}; i\sinh^{-1}\left(\frac{\sqrt{\frac{de}{f}-c}}{\sqrt{c+dx}}\right), \frac{dfg-cfh}{deh-cfh}\right)\right)}{\sqrt{e+fx}\sqrt{g+hx}(ad-bc)\sqrt{\frac{de}{f}-c}}$$

Antiderivative was successfully verified.

[In] Integrate[1/((a + b*x)*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]),x]

[Out] ((2*I)*(c + d*x)*Sqrt[(d*(e + f*x))/(f*(c + d*x))]*Sqrt[(d*(g + h*x))/(h*(c + d*x))]*(EllipticF[I*ArcSinh[Sqrt[-c + (d*e)/f]/Sqrt[c + d*x]], (d*f*g - c*f*h)/(d*e*h - c*f*h)] - EllipticPi[((b*c - a*d)*f)/(b*(-(d*e) + c*f)), I*ArcSinh[Sqrt[-c + (d*e)/f]/Sqrt[c + d*x]], (d*f*g - c*f*h)/(d*e*h - c*f*h)))/((-b*c) + a*d)*Sqrt[-c + (d*e)/f]*Sqrt[e + f*x]*Sqrt[g + h*x]

Maple [A] time = 0.026, size = 223, normalized size = 1.4

$$2 \frac{\sqrt{dx+c}\sqrt{fx+e}\sqrt{hx+g}(cf-de)}{(ad-bc)f(dfhx^3+cfhx^2+dehx^2+dfgx^2+cehx+cfgx+degx+ceg)} \sqrt{\frac{(dx+c)f}{cf-de}} \sqrt{-\frac{(hx+g)d}{ch-dg}} \sqrt{-\frac{(fx+e)d}{cf-de}} \text{Ell}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(1/(b*x+a)/(d*x+c)^(1/2)/(f*x+e)^(1/2)/(h*x+g)^(1/2),x)

[Out] 2*(d*x+c)^(1/2)*(f*x+e)^(1/2)*(h*x+g)^(1/2)/f*((d*x+c)*f/(c*f-d*e))^(1/2)*(-(h*x+g)*d/(c*h-d*g))^(1/2)*(-(f*x+e)*d/(c*f-d*e))^(1/2)*EllipticPi(((d*x+c)*f/(c*f-d*e))^(1/2),-(c*f-d*e)*b/f/(a*d-b*c),((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*((c*f-d*e)/(a*d-b*c)/(d*f*h*x^3+c*f*h*x^2+d*e*h*x^2+d*f*g*x^2+c*e*h*x+c*f*g*x+d*e*g*x+c*e*g)

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx+a)\sqrt{dx+c}\sqrt{fx+e}\sqrt{hx+g}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(b*x+a)/(d*x+c)^(1/2)/(f*x+e)^(1/2)/(h*x+g)^(1/2),x, algorithm="maxima")

[Out] integrate(1/((b*x + a)*sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)), x)

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(b*x+a)/(d*x+c)^(1/2)/(f*x+e)^(1/2)/(h*x+g)^(1/2),x, algorithm="fricas")

[Out] Timed out

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(a + bx) \sqrt{c + dx} \sqrt{e + fx} \sqrt{g + hx}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(b*x+a)/(d*x+c)**(1/2)/(f*x+e)**(1/2)/(h*x+g)**(1/2),x)

[Out] Integral(1/((a + b*x)*sqrt(c + d*x)*sqrt(e + f*x)*sqrt(g + h*x)), x)

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx + a) \sqrt{dx + c} \sqrt{fx + e} \sqrt{hx + g}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(b*x+a)/(d*x+c)^(1/2)/(f*x+e)^(1/2)/(h*x+g)^(1/2),x, algorithm="giac")

[Out] integrate(1/((b*x + a)*sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)), x)

$$3.71 \quad \int \frac{1}{(a+bx)(c+dx)^{3/2}\sqrt{e+fx}\sqrt{g+hx}} dx$$

Optimal. Leaf size=393

$$\frac{2d^2\sqrt{e+fx}\sqrt{g+hx}}{\sqrt{c+dx}(bc-ad)(de-cf)(dg-ch)} - \frac{2d\sqrt{h}\sqrt{c+dx}\sqrt{eh-fg}\sqrt{\frac{f(g+hx)}{fg-eh}}E\left(\sin^{-1}\left(\frac{\sqrt{h}\sqrt{e+fx}}{\sqrt{eh-fg}}\right)\middle| -\frac{d(fg-eh)}{(de-cf)h}\right)}{\sqrt{g+hx}(bc-ad)(de-cf)(dg-ch)\sqrt{-\frac{f(c+dx)}{de-cf}}} - \frac{2b\sqrt{cf-de}\sqrt{\frac{d}{a}}}{\sqrt{c+dx}(bc-ad)(de-cf)(dg-ch)}$$

[Out] (2*d^2*Sqrt[e + f*x]*Sqrt[g + h*x])/((b*c - a*d)*(d*e - c*f)*(d*g - c*h)*Sqrt[c + d*x]) - (2*d*Sqrt[h]*Sqrt[-(f*g) + e*h]*Sqrt[c + d*x]*Sqrt[(f*(g + h*x))/(f*g - e*h)]*EllipticE[ArcSin[(Sqrt[h]*Sqrt[e + f*x])/Sqrt[-(f*g) + e*h]], -((d*(f*g - e*h))/((d*e - c*f)*h))])/((b*c - a*d)*(d*e - c*f)*(d*g - c*h)*Sqrt[-((f*(c + d*x))/(d*e - c*f))]*Sqrt[g + h*x]) - (2*b*Sqrt[-(d*e) + c*f]*Sqrt[(d*(e + f*x))/(d*e - c*f)]*Sqrt[(d*(g + h*x))/(d*g - c*h)]*EllipticPi[-((b*(d*e - c*f))/((b*c - a*d)*f)), ArcSin[(Sqrt[f]*Sqrt[c + d*x])/Sqrt[-(d*e) + c*f]], ((d*e - c*f)*h)/(f*(d*g - c*h)))/((b*c - a*d)^2*Sqrt[f]*Sqrt[e + f*x]*Sqrt[g + h*x])

Rubi [A] time = 0.623636, antiderivative size = 393, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 8, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}} = 0.229$, Rules used = {179, 104, 21, 114, 113, 169, 538, 537}

$$\frac{2d^2\sqrt{e+fx}\sqrt{g+hx}}{\sqrt{c+dx}(bc-ad)(de-cf)(dg-ch)} - \frac{2d\sqrt{h}\sqrt{c+dx}\sqrt{eh-fg}\sqrt{\frac{f(g+hx)}{fg-eh}}E\left(\sin^{-1}\left(\frac{\sqrt{h}\sqrt{e+fx}}{\sqrt{eh-fg}}\right)\middle| -\frac{d(fg-eh)}{(de-cf)h}\right)}{\sqrt{g+hx}(bc-ad)(de-cf)(dg-ch)\sqrt{-\frac{f(c+dx)}{de-cf}}} - \frac{2b\sqrt{cf-de}\sqrt{\frac{d}{a}}}{\sqrt{c+dx}(bc-ad)(de-cf)(dg-ch)}$$

Antiderivative was successfully verified.

[In] Int[1/((a + b*x)*(c + d*x)^(3/2)*Sqrt[e + f*x]*Sqrt[g + h*x]),x]

[Out] (2*d^2*Sqrt[e + f*x]*Sqrt[g + h*x])/((b*c - a*d)*(d*e - c*f)*(d*g - c*h)*Sqrt[c + d*x]) - (2*d*Sqrt[h]*Sqrt[-(f*g) + e*h]*Sqrt[c + d*x]*Sqrt[(f*(g + h*x))/(f*g - e*h)]*EllipticE[ArcSin[(Sqrt[h]*Sqrt[e + f*x])/Sqrt[-(f*g) + e*h]], -((d*(f*g - e*h))/((d*e - c*f)*h))])/((b*c - a*d)*(d*e - c*f)*(d*g - c*h)*Sqrt[-((f*(c + d*x))/(d*e - c*f))]*Sqrt[g + h*x]) - (2*b*Sqrt[-(d*e) + c*f]*Sqrt[(d*(e + f*x))/(d*e - c*f)]*Sqrt[(d*(g + h*x))/(d*g - c*h)]*EllipticPi[-((b*(d*e - c*f))/((b*c - a*d)*f)), ArcSin[(Sqrt[f]*Sqrt[c + d*x])/Sqrt[-(d*e) + c*f]], ((d*e - c*f)*h)/(f*(d*g - c*h)))/((b*c - a*d)^2*Sqrt[f]*Sqrt[e + f*x]*Sqrt[g + h*x])

$\text{Sqrt}[e + f*x]*\text{Sqrt}[g + h*x]$

Rule 179

$\text{Int}[(((a_.) + (b_.)*(x_))^{(m_.)*((c_.) + (d_.)*(x_))^{(n_.))}/(\text{Sqrt}[(e_.) + (f_.)*(x_)]*\text{Sqrt}[(g_.) + (h_.)*(x_)]), x_Symbol] \rightarrow \text{Int}[\text{ExpandIntegrand}[1/(\text{Sqrt}[c + d*x]*\text{Sqrt}[e + f*x]*\text{Sqrt}[g + h*x]), (a + b*x)^m*(c + d*x)^{(n + 1/2)}, x], x] /;$ $\text{FreeQ}\{a, b, c, d, e, f, g, h\}, x\} \ \&\& \ \text{IntegerQ}[m] \ \&\& \ \text{IntegerQ}[n + 1/2]$

Rule 104

$\text{Int}[((a_.) + (b_.)*(x_))^{(m_.)*((c_.) + (d_.)*(x_))^{(n_.)*((e_.) + (f_.)*(x_))^{(p_.)}}, x_Symbol] \rightarrow \text{Simp}[(b*(a + b*x)^{(m + 1)}*(c + d*x)^{(n + 1)}*(e + f*x)^{(p + 1)})/((m + 1)*(b*c - a*d)*(b*e - a*f)), x] + \text{Dist}[1/((m + 1)*(b*c - a*d)*(b*e - a*f)), \text{Int}[(a + b*x)^{(m + 1)}*(c + d*x)^n*(e + f*x)^p*\text{Simp}[a*d*f*(m + 1) - b*(d*e*(m + n + 2) + c*f*(m + p + 2)) - b*d*f*(m + n + p + 3)*x, x], x], x] /;$ $\text{FreeQ}\{a, b, c, d, e, f, n, p\}, x\} \ \&\& \ \text{LtQ}[m, -1] \ \&\& \ \text{IntegersQ}[2*m, 2*n, 2*p]$

Rule 21

$\text{Int}[(u_.)*((a_.) + (b_.)*(v_))^{(m_.)*((c_.) + (d_.)*(v_))^{(n_.)}}, x_Symbol] \rightarrow \text{Dist}[(b/d)^m, \text{Int}[u*(c + d*v)^{(m + n)}, x], x] /;$ $\text{FreeQ}\{a, b, c, d, n\}, x\} \ \&\& \ \text{EqQ}[b*c - a*d, 0] \ \&\& \ \text{IntegerQ}[m] \ \&\& \ (!\text{IntegerQ}[n] \ || \ \text{SimplerQ}[c + d*x, a + b*x])$

Rule 114

$\text{Int}[\text{Sqrt}[(e_.) + (f_.)*(x_)]/(\text{Sqrt}[(a_.) + (b_.)*(x_)]*\text{Sqrt}[(c_.) + (d_.)*(x_)]), x_Symbol] \rightarrow \text{Dist}[(\text{Sqrt}[e + f*x]*\text{Sqrt}[(b*(c + d*x))/(b*c - a*d)])/(\text{Sqrt}[c + d*x]*\text{Sqrt}[(b*(e + f*x))/(b*e - a*f)]), \text{Int}[\text{Sqrt}[(b*e)/(b*e - a*f) + (b*f*x)/(b*e - a*f)]/(\text{Sqrt}[a + b*x]*\text{Sqrt}[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)]), x], x] /;$ $\text{FreeQ}\{a, b, c, d, e, f\}, x\} \ \&\& \ !(\text{GtQ}[b/(b*c - a*d), 0] \ \&\& \ \text{GtQ}[b/(b*e - a*f), 0]) \ \&\& \ !\text{LtQ}[-(b*c - a*d)/d, 0]$

Rule 113

$\text{Int}[\text{Sqrt}[(e_.) + (f_.)*(x_)]/(\text{Sqrt}[(a_.) + (b_.)*(x_)]*\text{Sqrt}[(c_.) + (d_.)*(x_)]), x_Symbol] \rightarrow \text{Simp}[(2*\text{Rt}[-((b*e - a*f)/d), 2]*\text{EllipticE}[\text{ArcSin}[\text{Sqrt}[a + b*x]/\text{Rt}[-((b*c - a*d)/d), 2]], (f*(b*c - a*d))/(d*(b*e - a*f))]/b, x] /;$ $\text{FreeQ}\{a, b, c, d, e, f\}, x\} \ \&\& \ \text{GtQ}[b/(b*c - a*d), 0] \ \&\& \ \text{GtQ}[b/(b*e - a*f), 0] \ \&\& \ !\text{LtQ}[-((b*c - a*d)/d), 0] \ \&\& \ !(\text{SimplerQ}[c + d*x, a + b*x] \ \&\& \ \text{GtQ}[-(d/(b*c - a*d)), 0] \ \&\& \ \text{GtQ}[d/(d*e - c*f), 0]) \ \&\& \ !\text{LtQ}[(b*c - a*d)/b, 0]$

Rule 169

```
Int[1/(((a_.) + (b_.)*(x_))*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Dist[-2, Subst[Int[1/(Simp[b*c - a*d - b*x^2, x]*Sqrt[Simp[(d*e - c*f)/d + (f*x^2)/d, x]]*Sqrt[Simp[(d*g - c*h)/d + (h*x^2)/d, x]]), x], x, Sqrt[c + d*x]], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x] && !SimplerQ[e + f*x, c + d*x] && !SimplerQ[g + h*x, c + d*x]
```

Rule 538

```
Int[1/(((a_) + (b_.)*(x_)^2)*Sqrt[(c_) + (d_.)*(x_)^2]*Sqrt[(e_) + (f_.)*(x_)^2]), x_Symbol] := Dist[Sqrt[1 + (d*x^2)/c]/Sqrt[c + d*x^2], Int[1/((a + b*x^2)*Sqrt[1 + (d*x^2)/c]*Sqrt[e + f*x^2]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && !GtQ[c, 0]
```

Rule 537

```
Int[1/(((a_) + (b_.)*(x_)^2)*Sqrt[(c_) + (d_.)*(x_)^2]*Sqrt[(e_) + (f_.)*(x_)^2]), x_Symbol] := Simp[(1*EllipticPi[(b*c)/(a*d), ArcSin[Rt[-(d/c), 2]*x], (c*f)/(d*e)]/(a*Sqrt[c]*Sqrt[e]*Rt[-(d/c), 2]), x] /; FreeQ[{a, b, c, d, e, f}, x] && !GtQ[d/c, 0] && GtQ[c, 0] && GtQ[e, 0] && !( !GtQ[f/e, 0] && SimplerSqrtQ[-(f/e), -(d/c)])
```

Rubi steps

$$\begin{aligned}
\int \frac{1}{(a+bx)(c+dx)^{3/2}\sqrt{e+fx}\sqrt{g+hx}} dx &= \int \left(-\frac{d}{(bc-ad)(c+dx)^{3/2}\sqrt{e+fx}\sqrt{g+hx}} + \frac{b}{(bc-ad)(a+bx)\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}} \right) dx \\
&= \frac{b \int \frac{1}{(a+bx)\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}} dx}{bc-ad} - \frac{d \int \frac{1}{(c+dx)^{3/2}\sqrt{e+fx}\sqrt{g+hx}} dx}{bc-ad} \\
&= \frac{2d^2\sqrt{e+fx}\sqrt{g+hx}}{(bc-ad)(de-cf)(dg-ch)\sqrt{c+dx}} - \frac{(2b) \text{Subst} \left(\int \frac{1}{(bc-ad-bx^2)\sqrt{e-\frac{cf}{a}+\frac{fx^2}{a}}\sqrt{g+hx}} dx \right)}{bc-ad} \\
&= \frac{2d^2\sqrt{e+fx}\sqrt{g+hx}}{(bc-ad)(de-cf)(dg-ch)\sqrt{c+dx}} - \frac{(dfh) \int \frac{\sqrt{c+dx}}{\sqrt{e+fx}\sqrt{g+hx}} dx}{(bc-ad)(de-cf)(dg-ch)} - \frac{(2b) \sqrt{c+dx}}{(bc-ad)\sqrt{e+fx}\sqrt{g+hx}} \\
&= \frac{2d^2\sqrt{e+fx}\sqrt{g+hx}}{(bc-ad)(de-cf)(dg-ch)\sqrt{c+dx}} - \frac{(2b) \sqrt{\frac{d(e+fx)}{de-cf}} \sqrt{\frac{d(g+hx)}{dg-ch}} \text{Subst} \left(\int \frac{1}{(bc-ad-bx^2)\sqrt{e-\frac{cf}{a}+\frac{fx^2}{a}}} dx \right)}{(bc-ad)\sqrt{e+fx}\sqrt{g+hx}} \\
&= \frac{2d^2\sqrt{e+fx}\sqrt{g+hx}}{(bc-ad)(de-cf)(dg-ch)\sqrt{c+dx}} - \frac{2d\sqrt{h}\sqrt{-fg+eh}\sqrt{c+dx}\sqrt{\frac{f(g+hx)}{fg-eh}} E}{(bc-ad)(de-cf)(dg-ch)\sqrt{c+dx}}
\end{aligned}$$

Mathematica [C] time = 4.38364, size = 321, normalized size = 0.82

$$\frac{2i(c+dx)\sqrt{\frac{d(e+fx)}{f(c+dx)}}\sqrt{\frac{d(g+hx)}{h(c+dx)}} \left((adf - 2bcf + bde) \text{EllipticF} \left(i \sinh^{-1} \left(\frac{\sqrt{\frac{dg}{h}} - c}{\sqrt{c+dx}} \right), \frac{deh - cfh}{dfg - cfh} \right) + f(bc - ad) E \left(i \sinh^{-1} \left(\frac{\sqrt{\frac{dg}{h}} - c}{\sqrt{c+dx}} \right) \right) \right)}{\sqrt{e+fx}\sqrt{g+hx}(bc-ad)^2(cf-de)\sqrt{\frac{dg}{h} - c}}$$

Antiderivative was successfully verified.

[In] Integrate[1/((a + b*x)*(c + d*x)^(3/2)*Sqrt[e + f*x]*Sqrt[g + h*x]),x]

[Out] ((2*I)*(c + d*x)*Sqrt[(d*(e + f*x))/(f*(c + d*x)*)]*Sqrt[(d*(g + h*x))/(h*(c + d*x)])*((b*c - a*d)*f*EllipticE[I*ArcSinh[Sqrt[-c + (d*g)/h]/Sqrt[c + d*])])

```
x]], (d*e*h - c*f*h)/(d*f*g - c*f*h)] + (b*d*e - 2*b*c*f + a*d*f)*EllipticF
[I*ArcSinh[Sqrt[-c + (d*g)/h]/Sqrt[c + d*x]], (d*e*h - c*f*h)/(d*f*g - c*f*
h)] + b*(-(d*e) + c*f)*EllipticPi(((b*c - a*d)*h)/(b*(-(d*g) + c*h)), I*Arc
Sinh[Sqrt[-c + (d*g)/h]/Sqrt[c + d*x]], (d*e*h - c*f*h)/(d*f*g - c*f*h)))/
((b*c - a*d)^2*(-(d*e) + c*f)*Sqrt[-c + (d*g)/h]*Sqrt[e + f*x]*Sqrt[g + h*x
])
```

Maple [B] time = 0.08, size = 2842, normalized size = 7.2

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*x+a)/(d*x+c)^(3/2)/(f*x+e)^(1/2)/(h*x+g)^(1/2),x)
```

```
[Out] 2*(d*x+c)^(1/2)*(f*x+e)^(1/2)*(h*x+g)^(1/2)*(-EllipticF(((d*x+c)*f/(c*f-d*e
))^1/2,((c*f-d*e)*h/f/(c*h-d*g))^1/2))*a*c*d^2*e*f*h*((d*x+c)*f/(c*f-d*e
))^1/2*(-(h*x+g)*d/(c*h-d*g))^1/2*(-(f*x+e)*d/(c*f-d*e))^1/2+Elliptic
F(((d*x+c)*f/(c*f-d*e))^1/2,((c*f-d*e)*h/f/(c*h-d*g))^1/2)*b*c^2*d*e*f*
h*((d*x+c)*f/(c*f-d*e))^1/2*(-(h*x+g)*d/(c*h-d*g))^1/2*(-(f*x+e)*d/(c*f
-d*e))^1/2-EllipticF(((d*x+c)*f/(c*f-d*e))^1/2,((c*f-d*e)*h/f/(c*h-d*g)
)^1/2))*b*c*d^2*e*f*g*((d*x+c)*f/(c*f-d*e))^1/2*(-(h*x+g)*d/(c*h-d*g))^1
/2*(-(f*x+e)*d/(c*f-d*e))^1/2+EllipticE(((d*x+c)*f/(c*f-d*e))^1/2,((c
*f-d*e)*h/f/(c*h-d*g))^1/2))*a*c*d^2*e*f*h*((d*x+c)*f/(c*f-d*e))^1/2*(-(
h*x+g)*d/(c*h-d*g))^1/2*(-(f*x+e)*d/(c*f-d*e))^1/2-EllipticE(((d*x+c)*f
/(c*f-d*e))^1/2,((c*f-d*e)*h/f/(c*h-d*g))^1/2))*b*c^2*d*e*f*h*((d*x+c)*f
/(c*f-d*e))^1/2*(-(h*x+g)*d/(c*h-d*g))^1/2*(-(f*x+e)*d/(c*f-d*e))^1/2
+EllipticE(((d*x+c)*f/(c*f-d*e))^1/2,((c*f-d*e)*h/f/(c*h-d*g))^1/2))*b*c
*d^2*e*f*g*((d*x+c)*f/(c*f-d*e))^1/2*(-(h*x+g)*d/(c*h-d*g))^1/2*(-(f*x+
e)*d/(c*f-d*e))^1/2+2*EllipticPi(((d*x+c)*f/(c*f-d*e))^1/2,-(c*f-d*e)*b
/f/(a*d-b*c),((c*f-d*e)*h/f/(c*h-d*g))^1/2))*b*c^2*d*e*f*h*((d*x+c)*f/(c*f
-d*e))^1/2*(-(h*x+g)*d/(c*h-d*g))^1/2*(-(f*x+e)*d/(c*f-d*e))^1/2-2*El
lipticPi(((d*x+c)*f/(c*f-d*e))^1/2,-(c*f-d*e)*b/f/(a*d-b*c),((c*f-d*e)*h/
f/(c*h-d*g))^1/2))*b*c*d^2*e*f*g*((d*x+c)*f/(c*f-d*e))^1/2*(-(h*x+g)*d/(
c*h-d*g))^1/2*(-(f*x+e)*d/(c*f-d*e))^1/2+x*b*c*d^2*f^2*g+EllipticE(((d*
x+c)*f/(c*f-d*e))^1/2,((c*f-d*e)*h/f/(c*h-d*g))^1/2))*b*c^3*f^2*h*((d*x+
c)*f/(c*f-d*e))^1/2*(-(h*x+g)*d/(c*h-d*g))^1/2*(-(f*x+e)*d/(c*f-d*e))^1
/2-EllipticPi(((d*x+c)*f/(c*f-d*e))^1/2,-(c*f-d*e)*b/f/(a*d-b*c),((c*f-
d*e)*h/f/(c*h-d*g))^1/2))*b*c^3*f^2*h*((d*x+c)*f/(c*f-d*e))^1/2*(-(h*x+g
)*d/(c*h-d*g))^1/2*(-(f*x+e)*d/(c*f-d*e))^1/2+EllipticPi(((d*x+c)*f/(c*
f-d*e))^1/2,-(c*f-d*e)*b/f/(a*d-b*c),((c*f-d*e)*h/f/(c*h-d*g))^1/2))*b*d
^3*e^2*g*((d*x+c)*f/(c*f-d*e))^1/2*(-(h*x+g)*d/(c*h-d*g))^1/2*(-(f*x+e)
```

```

*d/(c*f-d*e))^(1/2)-x^2*a*d^3*f^2*h-a*d^3*e*f*g+x*b*c*d^2*e*f*h+b*c*d^2*e*f
*g-EllipticF(((d*x+c)*f/(c*f-d*e))^(1/2),((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*b
*c^3*f^2*h*((d*x+c)*f/(c*f-d*e))^(1/2)*(-(h*x+g)*d/(c*h-d*g))^(1/2)*(-(f*x+
e)*d/(c*f-d*e))^(1/2)-x*a*d^3*e*f*h+x^2*b*c*d^2*f^2*h-x*a*d^3*f^2*g-Ellipti
cPi(((d*x+c)*f/(c*f-d*e))^(1/2),-(c*f-d*e)*b/f/(a*d-b*c),((c*f-d*e)*h/f/(c*
h-d*g))^(1/2))*b*c*d^2*e^2*h*((d*x+c)*f/(c*f-d*e))^(1/2)*(-(h*x+g)*d/(c*h-d
*g))^(1/2)*(-(f*x+e)*d/(c*f-d*e))^(1/2)+EllipticF(((d*x+c)*f/(c*f-d*e))^(1/
2),((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*a*c^2*d*f^2*h*((d*x+c)*f/(c*f-d*e))^(1/
2)*(-(h*x+g)*d/(c*h-d*g))^(1/2)*(-(f*x+e)*d/(c*f-d*e))^(1/2)-EllipticF(((d*
x+c)*f/(c*f-d*e))^(1/2),((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*a*c*d^2*f^2*g*((d*
x+c)*f/(c*f-d*e))^(1/2)*(-(h*x+g)*d/(c*h-d*g))^(1/2)*(-(f*x+e)*d/(c*f-d*e))
^(1/2)+EllipticF(((d*x+c)*f/(c*f-d*e))^(1/2),((c*f-d*e)*h/f/(c*h-d*g))^(1/2
))*a*d^3*e*f*g*((d*x+c)*f/(c*f-d*e))^(1/2)*(-(h*x+g)*d/(c*h-d*g))^(1/2)*(-(
f*x+e)*d/(c*f-d*e))^(1/2)+EllipticF(((d*x+c)*f/(c*f-d*e))^(1/2),((c*f-d*e)*
h/f/(c*h-d*g))^(1/2))*b*c^2*d*f^2*g*((d*x+c)*f/(c*f-d*e))^(1/2)*(-(h*x+g)*d
/(c*h-d*g))^(1/2)*(-(f*x+e)*d/(c*f-d*e))^(1/2)-EllipticE(((d*x+c)*f/(c*f-d*
e))^(1/2),((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*a*c^2*d*f^2*h*((d*x+c)*f/(c*f-d*
e))^(1/2)*(-(h*x+g)*d/(c*h-d*g))^(1/2)*(-(f*x+e)*d/(c*f-d*e))^(1/2)+Ellipti
cE(((d*x+c)*f/(c*f-d*e))^(1/2),((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*a*c*d^2*f^2
*g*((d*x+c)*f/(c*f-d*e))^(1/2)*(-(h*x+g)*d/(c*h-d*g))^(1/2)*(-(f*x+e)*d/(c*
f-d*e))^(1/2)-EllipticE(((d*x+c)*f/(c*f-d*e))^(1/2),((c*f-d*e)*h/f/(c*h-d*g
))^(1/2))*a*d^3*e*f*g*((d*x+c)*f/(c*f-d*e))^(1/2)*(-(h*x+g)*d/(c*h-d*g))^(1
/2)*(-(f*x+e)*d/(c*f-d*e))^(1/2)-EllipticE(((d*x+c)*f/(c*f-d*e))^(1/2),((c*
f-d*e)*h/f/(c*h-d*g))^(1/2))*b*c^2*d*f^2*g*((d*x+c)*f/(c*f-d*e))^(1/2)*(-(h
*x+g)*d/(c*h-d*g))^(1/2)*(-(f*x+e)*d/(c*f-d*e))^(1/2)+EllipticPi(((d*x+c)*f
/(c*f-d*e))^(1/2),-(c*f-d*e)*b/f/(a*d-b*c),((c*f-d*e)*h/f/(c*h-d*g))^(1/2))
*b*c^2*d*f^2*g*((d*x+c)*f/(c*f-d*e))^(1/2)*(-(h*x+g)*d/(c*h-d*g))^(1/2)*(-(
f*x+e)*d/(c*f-d*e))^(1/2))/f/(a*d-b*c)^2/(c*h-d*g)/(c*f-d*e)/(d*f*h*x^3+c*f
*h*x^2+d*e*h*x^2+d*f*g*x^2+c*e*h*x+c*f*g*x+d*e*g*x+c*e*g)

```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx+a)(dx+c)^{\frac{3}{2}}\sqrt{fx+e}\sqrt{hx+g}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```

[In] integrate(1/(b*x+a)/(d*x+c)^(3/2)/(f*x+e)^(1/2)/(h*x+g)^(1/2),x, algorithm=
"maxima")

```

```

[Out] integrate(1/((b*x + a)*(d*x + c)^(3/2)*sqrt(f*x + e)*sqrt(h*x + g)), x)

```

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(b*x+a)/(d*x+c)^(3/2)/(f*x+e)^(1/2)/(h*x+g)^(1/2),x, algorithm="fricas")

[Out] Timed out

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(a+bx)(c+dx)^{\frac{3}{2}}\sqrt{e+fx}\sqrt{g+hx}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(b*x+a)/(d*x+c)**(3/2)/(f*x+e)**(1/2)/(h*x+g)**(1/2),x)

[Out] Integral(1/((a + b*x)*(c + d*x)**(3/2)*sqrt(e + f*x)*sqrt(g + h*x)), x)

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx+a)(dx+c)^{\frac{3}{2}}\sqrt{fx+e}\sqrt{hx+g}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(b*x+a)/(d*x+c)^(3/2)/(f*x+e)^(1/2)/(h*x+g)^(1/2),x, algorithm="giac")

[Out] integrate(1/((b*x + a)*(d*x + c)^(3/2)*sqrt(f*x + e)*sqrt(h*x + g)), x)

$$3.72 \quad \int \frac{1}{(a+bx)(c+dx)^{5/2}\sqrt{e+fx}\sqrt{g+hx}} dx$$

Optimal. Leaf size=875

$$\frac{2\sqrt{cf-de}\sqrt{\frac{d(e+fx)}{de-cf}}\sqrt{\frac{d(g+hx)}{dg-ch}}\Pi\left(-\frac{b(de-cf)}{(bc-ad)f}; \sin^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{cf-de}}\right)\middle|\frac{(de-cf)h}{f(dg-ch)}\right)b^2}{(bc-ad)^3\sqrt{f}\sqrt{e+fx}\sqrt{g+hx}} - \frac{2d\sqrt{h}\sqrt{eh-fg}\sqrt{c+dx}\sqrt{\frac{f(g+hx)}{fg-eh}}E\left(\sin^{-1}\left(\frac{\sqrt{h}\sqrt{c+dx}}{\sqrt{fg-eh}}\right)\middle|\frac{f(c+dx)}{fg-eh}\right)}{(bc-ad)^2(de-cf)(dg-ch)\sqrt{-\frac{f(c+dx)}{de-cf}}}$$

[Out] $(2*d^2*\text{Sqrt}[e + f*x]*\text{Sqrt}[g + h*x])/(3*(b*c - a*d)*(d*e - c*f)*(d*g - c*h)*(c + d*x)^{(3/2)}) + (2*b*d^2*\text{Sqrt}[e + f*x]*\text{Sqrt}[g + h*x])/((b*c - a*d)^2*(d*e - c*f)*(d*g - c*h)*\text{Sqrt}[c + d*x]) - (4*d^2*(d*f*g + d*e*h - 2*c*f*h)*\text{Sqrt}[e + f*x]*\text{Sqrt}[g + h*x])/(3*(b*c - a*d)*(d*e - c*f)^2*(d*g - c*h)^2*\text{Sqrt}[c + d*x]) + (4*d*\text{Sqrt}[f]*(d*f*g + d*e*h - 2*c*f*h)*\text{Sqrt}[(d*(e + f*x))/(d*e - c*f)]*\text{Sqrt}[g + h*x]*\text{EllipticE}[\text{ArcSin}[(\text{Sqrt}[f]*\text{Sqrt}[c + d*x])/(\text{Sqrt}[-(d*e) + c*f])], ((d*e - c*f)*h)/(f*(d*g - c*h))])/(3*(b*c - a*d)*(-(d*e) + c*f)^{(3/2)}*(d*g - c*h)^2*\text{Sqrt}[e + f*x]*\text{Sqrt}[(d*(g + h*x))/(d*g - c*h)]) - (2*b*d*\text{Sqrt}[h]*\text{Sqrt}[-(f*g) + e*h]*\text{Sqrt}[c + d*x]*\text{Sqrt}[(f*(g + h*x))/(f*g - e*h)]*\text{EllipticE}[\text{ArcSin}[(\text{Sqrt}[h]*\text{Sqrt}[e + f*x])/(\text{Sqrt}[-(f*g) + e*h])], -((d*(f*g - e*h))/(d*e - c*f)*h))]/((b*c - a*d)^2*(d*e - c*f)*(d*g - c*h)*\text{Sqrt}[-((f*(c + d*x))/(d*e - c*f))]*\text{Sqrt}[g + h*x]) - (2*\text{Sqrt}[f]*(2*d*f*g + d*e*h - 3*c*f*h)*\text{Sqrt}[(d*(e + f*x))/(d*e - c*f)]*\text{Sqrt}[(d*(g + h*x))/(d*g - c*h)]*\text{EllipticF}[\text{ArcSin}[(\text{Sqrt}[f]*\text{Sqrt}[c + d*x])/(\text{Sqrt}[-(d*e) + c*f])], ((d*e - c*f)*h)/(f*(d*g - c*h))])/(3*(b*c - a*d)*(-(d*e) + c*f)^{(3/2)}*(d*g - c*h)*\text{Sqrt}[e + f*x]*\text{Sqrt}[g + h*x]) - (2*b^2*\text{Sqrt}[-(d*e) + c*f]*\text{Sqrt}[(d*(e + f*x))/(d*e - c*f)]*\text{Sqrt}[(d*(g + h*x))/(d*g - c*h)]*\text{EllipticPi}[-((b*(d*e - c*f))/(b*c - a*d)*f]), \text{ArcSin}[(\text{Sqrt}[f]*\text{Sqrt}[c + d*x])/(\text{Sqrt}[-(d*e) + c*f])], ((d*e - c*f)*h)/(f*(d*g - c*h)))]/(b*c - a*d)^3*\text{Sqrt}[f]*\text{Sqrt}[e + f*x]*\text{Sqrt}[g + h*x])$

Rubi [A] time = 1.33919, antiderivative size = 875, normalized size of antiderivative = 1., number of steps used = 18, number of rules used = 12, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}} = 0.343$, Rules used = {179, 104, 152, 158, 114, 113, 121, 120, 21, 169, 538, 537}

$$\frac{2\sqrt{cf-de}\sqrt{\frac{d(e+fx)}{de-cf}}\sqrt{\frac{d(g+hx)}{dg-ch}}\Pi\left(-\frac{b(de-cf)}{(bc-ad)f}; \sin^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{cf-de}}\right)\middle|\frac{(de-cf)h}{f(dg-ch)}\right)b^2}{(bc-ad)^3\sqrt{f}\sqrt{e+fx}\sqrt{g+hx}} - \frac{2d\sqrt{h}\sqrt{eh-fg}\sqrt{c+dx}\sqrt{\frac{f(g+hx)}{fg-eh}}E\left(\sin^{-1}\left(\frac{\sqrt{h}\sqrt{c+dx}}{\sqrt{fg-eh}}\right)\middle|\frac{f(c+dx)}{fg-eh}\right)}{(bc-ad)^2(de-cf)(dg-ch)\sqrt{-\frac{f(c+dx)}{de-cf}}}$$

Antiderivative was successfully verified.

[In] Int[1/((a + b*x)*(c + d*x)^(5/2)*Sqrt[e + f*x]*Sqrt[g + h*x]), x]

```
[Out] (2*d^2*Sqrt[e + f*x]*Sqrt[g + h*x])/(3*(b*c - a*d)*(d*e - c*f)*(d*g - c*h)*
(c + d*x)^(3/2)) + (2*b*d^2*Sqrt[e + f*x]*Sqrt[g + h*x])/((b*c - a*d)^2*(d*
e - c*f)*(d*g - c*h)*Sqrt[c + d*x]) - (4*d^2*(d*f*g + d*e*h - 2*c*f*h)*Sqrt
[e + f*x]*Sqrt[g + h*x])/(3*(b*c - a*d)*(d*e - c*f)^2*(d*g - c*h)^2*Sqrt[c
+ d*x]) + (4*d*Sqrt[f]*(d*f*g + d*e*h - 2*c*f*h)*Sqrt[(d*(e + f*x))/(d*e -
c*f)]*Sqrt[g + h*x]*EllipticE[ArcSin[(Sqrt[f]*Sqrt[c + d*x])/Sqrt[-(d*e) +
c*f]], ((d*e - c*f)*h)/(f*(d*g - c*h))]/(3*(b*c - a*d)*(-(d*e) + c*f)^(3/2)
)*(d*g - c*h)^2*Sqrt[e + f*x]*Sqrt[(d*(g + h*x))/(d*g - c*h)]) - (2*b*d*Sqr
t[h]*Sqrt[-(f*g) + e*h]*Sqrt[c + d*x]*Sqrt[(f*(g + h*x))/(f*g - e*h)]*Ellip
ticE[ArcSin[(Sqrt[h]*Sqrt[e + f*x])/Sqrt[-(f*g) + e*h]], -((d*(f*g - e*h))/
((d*e - c*f)*h))]/((b*c - a*d)^2*(d*e - c*f)*(d*g - c*h)*Sqrt[-((f*(c + d*
x))/(d*e - c*f))]*Sqrt[g + h*x]) - (2*Sqrt[f]*(2*d*f*g + d*e*h - 3*c*f*h)*S
qrt[(d*(e + f*x))/(d*e - c*f)]*Sqrt[(d*(g + h*x))/(d*g - c*h)]*EllipticF[Ar
cSin[(Sqrt[f]*Sqrt[c + d*x])/Sqrt[-(d*e) + c*f]], ((d*e - c*f)*h)/(f*(d*g -
c*h))]/(3*(b*c - a*d)*(-(d*e) + c*f)^(3/2)*(d*g - c*h)*Sqrt[e + f*x]*Sqrt
[g + h*x]) - (2*b^2*Sqrt[-(d*e) + c*f]*Sqrt[(d*(e + f*x))/(d*e - c*f)]*Sqrt
[(d*(g + h*x))/(d*g - c*h)]*EllipticPi[-((b*(d*e - c*f))/((b*c - a*d)*f)),
ArcSin[(Sqrt[f]*Sqrt[c + d*x])/Sqrt[-(d*e) + c*f]], ((d*e - c*f)*h)/(f*(d*g
- c*h))]/((b*c - a*d)^3*Sqrt[f]*Sqrt[e + f*x]*Sqrt[g + h*x])
```

Rule 179

```
Int[(((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.))/(Sqrt[(e_.) + (f
_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Int[ExpandIntegrand[1/(Sqr
t[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]), (a + b*x)^m*(c + d*x)^(n + 1/2),
x], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x] && IntegerQ[m] && IntegerQ[n +
1/2]
```

Rule 104

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_
))^p_], x_Symbol] := Simp[(b*(a + b*x)^(m + 1)*(c + d*x)^(n + 1)*(e + f*x)
)^(p + 1))/((m + 1)*(b*c - a*d)*(b*e - a*f)), x] + Dist[1/((m + 1)*(b*c - a
*d)*(b*e - a*f)), Int[(a + b*x)^(m + 1)*(c + d*x)^n*(e + f*x)^p*Simp[a*d*f*
(m + 1) - b*(d*e*(m + n + 2) + c*f*(m + p + 2)) - b*d*f*(m + n + p + 3)*x,
x], x], x] /; FreeQ[{a, b, c, d, e, f, n, p}, x] && LtQ[m, -1] && IntegerQ
[2*m, 2*n, 2*p]
```

Rule 152

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_
))^p_)*((g_.) + (h_.)*(x_)), x_Symbol] := Simp[((b*g - a*h)*(a + b*x)^(m +
1)*(c + d*x)^(n + 1)*(e + f*x)^(p + 1))/((m + 1)*(b*c - a*d)*(b*e - a*f)),
x] + Dist[1/((m + 1)*(b*c - a*d)*(b*e - a*f)), Int[(a + b*x)^(m + 1)*(c + d
*x)^n*(e + f*x)^p*Simp[(a*d*f*g - b*(d*e + c*f)*g + b*c*e*h)*(m + 1) - (b*g
```



```

- a*h)*(d*e*(n + 1) + c*f*(p + 1)) - d*f*(b*g - a*h)*(m + n + p + 3)*x, x]
, x], x] /; FreeQ[{a, b, c, d, e, f, g, h, n, p}, x] && LtQ[m, -1] && Integ
ersQ[2*m, 2*n, 2*p]

```

Rule 158

```

Int[((g_.) + (h_.)*(x_))/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]*
Sqrt[(e_.) + (f_.)*(x_)]), x_Symbol] := Dist[h/f, Int[Sqrt[e + f*x]/(Sqrt[a
+ b*x]*Sqrt[c + d*x]), x], x] + Dist[(f*g - e*h)/f, Int[1/(Sqrt[a + b*x]*Sq
rt[c + d*x]*Sqrt[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x] &&
SimplerQ[a + b*x, e + f*x] && SimplerQ[c + d*x, e + f*x]

```

Rule 114

```

Int[Sqrt[(e_.) + (f_.)*(x_)]/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_
)]), x_Symbol] := Dist[(Sqrt[e + f*x]*Sqrt[(b*(c + d*x))/(b*c - a*d)])/(Sqr
t[c + d*x]*Sqrt[(b*(e + f*x))/(b*e - a*f)]), Int[Sqrt[(b*e)/(b*e - a*f)] + (
b*f*x)/(b*e - a*f)]/(Sqrt[a + b*x]*Sqrt[(b*c)/(b*c - a*d) + (b*d*x)/(b*c -
a*d)]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && !(GtQ[b/(b*c - a*d), 0]
&& GtQ[b/(b*e - a*f), 0]) && !LtQ[-((b*c - a*d)/d), 0]

```

Rule 113

```

Int[Sqrt[(e_.) + (f_.)*(x_)]/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_
)]), x_Symbol] := Simp[(2*Rt[-((b*e - a*f)/d), 2]*EllipticE[ArcSin[Sqrt[a +
b*x]/Rt[-((b*c - a*d)/d), 2]], (f*(b*c - a*d))/(d*(b*e - a*f)))]/b, x] /;
FreeQ[{a, b, c, d, e, f}, x] && GtQ[b/(b*c - a*d), 0] && GtQ[b/(b*e - a*f),
0] && !LtQ[-((b*c - a*d)/d), 0] && !(SimplerQ[c + d*x, a + b*x] && GtQ[-
(d/(b*c - a*d)), 0] && GtQ[d/(d*e - c*f), 0] && !LtQ[(b*c - a*d)/b, 0])

```

Rule 121

```

Int[1/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x
_)]), x_Symbol] := Dist[Sqrt[(b*(c + d*x))/(b*c - a*d)]/Sqrt[c + d*x], Int[
1/(Sqrt[a + b*x]*Sqrt[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)]*Sqrt[e + f*x
]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && !GtQ[(b*c - a*d)/b, 0] && Si
mplerQ[a + b*x, c + d*x] && SimplerQ[a + b*x, e + f*x]

```

Rule 120

```

Int[1/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x
_)]), x_Symbol] := Simp[(2*Rt[-(b/d), 2]*EllipticF[ArcSin[Sqrt[a + b*x]/(Rt
[-(b/d), 2]*Sqrt[(b*c - a*d)/b]]], (f*(b*c - a*d))/(d*(b*e - a*f)))]/(b*Sqr
t[(b*e - a*f)/b]), x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[b/(b*c - a*d),
0] && GtQ[b/(b*e - a*f), 0] && SimplerQ[a + b*x, c + d*x] && SimplerQ[a +

```

$b*x, e + f*x]$ && (PosQ[-((b*c - a*d)/d)] || NegQ[-((b*e - a*f)/f)])

Rule 21

```
Int[(u_.)*((a_) + (b_.)*(v_))^(m_.)*((c_) + (d_.)*(v_))^(n_.), x_Symbol] :>
  Dist[(b/d)^m, Int[u*(c + d*v)^(m + n), x], x] /; FreeQ[{a, b, c, d, n}, x]
  && EqQ[b*c - a*d, 0] && IntegerQ[m] && (!IntegerQ[n] || SimplerQ[c + d*x,
  a + b*x])
```

Rule 169

```
Int[1/(((a_.) + (b_.)*(x_))*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] :> Dist[-2, Subst[Int[1/(Simp[b*c -
  a*d - b*x^2, x]*Sqrt[Simp[(d*e - c*f)/d + (f*x^2)/d, x]]*Sqrt[Simp[(d*g -
  c*h)/d + (h*x^2)/d, x]]], x], x, Sqrt[c + d*x]], x] /; FreeQ[{a, b, c, d, e,
  f, g, h}, x] && !SimplerQ[e + f*x, c + d*x] && !SimplerQ[g + h*x, c + d
  *x]
```

Rule 538

```
Int[1/(((a_) + (b_.)*(x_)^2)*Sqrt[(c_) + (d_.)*(x_)^2]*Sqrt[(e_) + (f_.)*(x_)^2]), x_Symbol] :> Dist[Sqrt[1 + (d*x^2)/c]/Sqrt[c + d*x^2], Int[1/((a +
  b*x^2)*Sqrt[1 + (d*x^2)/c]*Sqrt[e + f*x^2]), x], x] /; FreeQ[{a, b, c, d, e,
  f}, x] && !GtQ[c, 0]
```

Rule 537

```
Int[1/(((a_) + (b_.)*(x_)^2)*Sqrt[(c_) + (d_.)*(x_)^2]*Sqrt[(e_) + (f_.)*(x_)^2]), x_Symbol] :> Simp[(1*EllipticPi[(b*c)/(a*d), ArcSin[Rt[-(d/c), 2]*x], (c*f)/(d*e)]/(a*Sqrt[c]*Sqrt[e]*Rt[-(d/c), 2]), x] /; FreeQ[{a, b, c, d, e, f}, x] && !GtQ[d/c, 0] && GtQ[c, 0] && GtQ[e, 0] && !( !GtQ[f/e, 0] && SimplerSqrtQ[-(f/e), -(d/c)])
```

Rubi steps

$$\begin{aligned}
\int \frac{1}{(a+bx)(c+dx)^{5/2}\sqrt{e+fx}\sqrt{g+hx}} dx &= \int \left(\frac{d}{(bc-ad)(c+dx)^{5/2}\sqrt{e+fx}\sqrt{g+hx}} - \frac{bd}{(bc-ad)^2(c+dx)^{3/2}\sqrt{e+fx}\sqrt{g+hx}} \right) dx \\
&= \frac{b^2 \int \frac{1}{(a+bx)\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}} dx}{(bc-ad)^2} - \frac{(bd) \int \frac{1}{(c+dx)^{3/2}\sqrt{e+fx}\sqrt{g+hx}} dx}{(bc-ad)^2} - \frac{d \int \frac{1}{(c+dx)^{5/2}} dx}{bc} \\
&= \frac{2d^2\sqrt{e+fx}\sqrt{g+hx}}{3(bc-ad)(de-cf)(dg-ch)(c+dx)^{3/2}} + \frac{2bd^2\sqrt{e+fx}\sqrt{g+hx}}{(bc-ad)^2(de-cf)(dg-ch)\sqrt{c+dx}} \\
&= \frac{2d^2\sqrt{e+fx}\sqrt{g+hx}}{3(bc-ad)(de-cf)(dg-ch)(c+dx)^{3/2}} + \frac{2bd^2\sqrt{e+fx}\sqrt{g+hx}}{(bc-ad)^2(de-cf)(dg-ch)\sqrt{c+dx}} \\
&= \frac{2d^2\sqrt{e+fx}\sqrt{g+hx}}{3(bc-ad)(de-cf)(dg-ch)(c+dx)^{3/2}} + \frac{2bd^2\sqrt{e+fx}\sqrt{g+hx}}{(bc-ad)^2(de-cf)(dg-ch)\sqrt{c+dx}} \\
&= \frac{2d^2\sqrt{e+fx}\sqrt{g+hx}}{3(bc-ad)(de-cf)(dg-ch)(c+dx)^{3/2}} + \frac{2bd^2\sqrt{e+fx}\sqrt{g+hx}}{(bc-ad)^2(de-cf)(dg-ch)\sqrt{c+dx}} \\
&= \frac{2d^2\sqrt{e+fx}\sqrt{g+hx}}{3(bc-ad)(de-cf)(dg-ch)(c+dx)^{3/2}} + \frac{2bd^2\sqrt{e+fx}\sqrt{g+hx}}{(bc-ad)^2(de-cf)(dg-ch)\sqrt{c+dx}} \\
&= \frac{2d^2\sqrt{e+fx}\sqrt{g+hx}}{3(bc-ad)(de-cf)(dg-ch)(c+dx)^{3/2}} + \frac{2bd^2\sqrt{e+fx}\sqrt{g+hx}}{(bc-ad)^2(de-cf)(dg-ch)\sqrt{c+dx}} \\
&= \frac{2d^2\sqrt{e+fx}\sqrt{g+hx}}{3(bc-ad)(de-cf)(dg-ch)(c+dx)^{3/2}} + \frac{2bd^2\sqrt{e+fx}\sqrt{g+hx}}{(bc-ad)^2(de-cf)(dg-ch)\sqrt{c+dx}}
\end{aligned}$$

Mathematica [C] time = 17.4941, size = 12191, normalized size = 13.93

Result too large to show

Warning: Unable to verify antiderivative.

```
[In] Integrate[1/((a + b*x)*(c + d*x)^(5/2)*Sqrt[e + f*x]*Sqrt[g + h*x]),x]
```

```
[Out] Result too large to show
```

Maple [B] time = 0.257, size = 17330, normalized size = 19.8

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*x+a)/(d*x+c)^(5/2)/(f*x+e)^(1/2)/(h*x+g)^(1/2),x)
```

```
[Out] result too large to display
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx+a)(dx+c)^{\frac{5}{2}}\sqrt{fx+e}\sqrt{hx+g}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*x+a)/(d*x+c)^(5/2)/(f*x+e)^(1/2)/(h*x+g)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(1/((b*x + a)*(d*x + c)^(5/2)*sqrt(f*x + e)*sqrt(h*x + g)), x)
```

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*x+a)/(d*x+c)^(5/2)/(f*x+e)^(1/2)/(h*x+g)^(1/2),x, algorithm="fricas")
```

[Out] Timed out

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(b*x+a)/(d*x+c)**(5/2)/(f*x+e)**(1/2)/(h*x+g)**(1/2),x)

[Out] Timed out

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx+a)(dx+c)^{\frac{5}{2}}\sqrt{fx+e}\sqrt{hx+g}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(b*x+a)/(d*x+c)^(5/2)/(f*x+e)^(1/2)/(h*x+g)^(1/2),x, algorithm="giac")

[Out] integrate(1/((b*x + a)*(d*x + c)^(5/2)*sqrt(f*x + e)*sqrt(h*x + g)), x)

$$3.73 \quad \int \frac{1}{(a+bx)\sqrt{c+dx}\sqrt{1-fx}\sqrt{1+fx}} dx$$

Optimal. Leaf size=74

$$\frac{2\sqrt{\frac{f(c+dx)}{cf+d}} \Pi\left(\frac{2b}{b+af}; \sin^{-1}\left(\frac{\sqrt{1-fx}}{\sqrt{2}}\right) \middle| \frac{2d}{d+cf}\right)}{(af+b)\sqrt{c+dx}}$$

[Out] (-2*Sqrt[(f*(c + d*x))/(d + c*f)]*EllipticPi[(2*b)/(b + a*f), ArcSin[Sqrt[1 - f*x]/Sqrt[2]], (2*d)/(d + c*f)])/((b + a*f)*Sqrt[c + d*x])

Rubi [A] time = 0.159653, antiderivative size = 74, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 36, $\frac{\text{number of rules}}{\text{integrand size}} = 0.083$, Rules used = {168, 538, 537}

$$\frac{2\sqrt{\frac{f(c+dx)}{cf+d}} \Pi\left(\frac{2b}{b+af}; \sin^{-1}\left(\frac{\sqrt{1-fx}}{\sqrt{2}}\right) \middle| \frac{2d}{d+cf}\right)}{(af+b)\sqrt{c+dx}}$$

Antiderivative was successfully verified.

[In] Int[1/((a + b*x)*Sqrt[c + d*x]*Sqrt[1 - f*x]*Sqrt[1 + f*x]),x]

[Out] (-2*Sqrt[(f*(c + d*x))/(d + c*f)]*EllipticPi[(2*b)/(b + a*f), ArcSin[Sqrt[1 - f*x]/Sqrt[2]], (2*d)/(d + c*f)])/((b + a*f)*Sqrt[c + d*x])

Rule 168

Int[1/(((a_.) + (b_.)*(x_))*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Dist[-2, Subst[Int[1/(Simp[b*c - a*d - b*x^2, x]*Sqrt[Simp[(d*e - c*f)/d + (f*x^2)/d, x]]*Sqrt[Simp[(d*g - c*h)/d + (h*x^2)/d, x]]), x], x, Sqrt[c + d*x]], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x] && GtQ[(d*e - c*f)/d, 0]

Rule 538

Int[1/(((a_.) + (b_.)*(x_)^2)*Sqrt[(c_.) + (d_.)*(x_)^2]*Sqrt[(e_.) + (f_.)*(x_)^2]), x_Symbol] := Dist[Sqrt[1 + (d*x^2)/c]/Sqrt[c + d*x^2], Int[1/((a + b*x^2)*Sqrt[1 + (d*x^2)/c]*Sqrt[e + f*x^2]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && !GtQ[c, 0]

Rule 537

```
Int[1/(((a_) + (b_.)*(x_)^2)*Sqrt[(c_) + (d_.)*(x_)^2]*Sqrt[(e_) + (f_.)*(x_)^2]), x_Symbol] :> Simp[(1*EllipticPi[(b*c)/(a*d), ArcSin[Rt[-(d/c), 2]*x], (c*f)/(d*e)])/((a*Sqrt[c]*Sqrt[e]*Rt[-(d/c), 2]), x] /; FreeQ[{a, b, c, d, e, f}, x] && !GtQ[d/c, 0] && GtQ[c, 0] && GtQ[e, 0] && !( !GtQ[f/e, 0] && SimplerSqrtQ[-(f/e), -(d/c)])]
```

Rubi steps

$$\int \frac{1}{(a+bx)\sqrt{c+dx}\sqrt{1-fx}\sqrt{1+fx}} dx = - \left(2 \operatorname{Subst} \left(\int \frac{1}{\sqrt{2-x^2}(b+af-bx^2)\sqrt{c+\frac{d}{f}-\frac{dx^2}{f}}} dx, x, \sqrt{1-fx} \right) \right)$$

$$= - \frac{\left(2\sqrt{\frac{f(c+dx)}{d+cf}} \operatorname{Subst} \left(\int \frac{1}{\sqrt{2-x^2}(b+af-bx^2)\sqrt{1-\frac{dx^2}{\left(\frac{d}{f}\right)f}}} dx, x, \sqrt{1-fx} \right) \right)}{\sqrt{c+dx}}$$

$$= - \frac{2\sqrt{\frac{f(c+dx)}{d+cf}} \Pi \left(\frac{2b}{b+af}; \sin^{-1} \left(\frac{\sqrt{1-fx}}{\sqrt{2}} \right) \middle| \frac{2d}{d+cf} \right)}{(b+af)\sqrt{c+dx}}$$

Mathematica [C] time = 0.868142, size = 203, normalized size = 2.74

$$\frac{2i(c+dx)\sqrt{\frac{d(fx-1)}{f(c+dx)}}\sqrt{\frac{dfx+d}{cf+dfx}} \left(\operatorname{EllipticF} \left(i \sinh^{-1} \left(\frac{\sqrt{-\frac{cf+d}{f}}}{\sqrt{c+dx}} \right), \frac{cf-d}{cf+d} \right) - \Pi \left(\frac{bcf-adf}{bd+bcf}; i \sinh^{-1} \left(\frac{\sqrt{-\frac{d+cf}{f}}}{\sqrt{c+dx}} \right) \middle| \frac{cf-d}{d+cf} \right) \right)}{\sqrt{1-f^2x^2}\sqrt{-\frac{cf+d}{f}}(ad-bc)}$$

Antiderivative was successfully verified.

[In] Integrate[1/((a + b*x)*Sqrt[c + d*x]*Sqrt[1 - f*x]*Sqrt[1 + f*x]),x]

[Out] ((2*I)*(c + d*x)*Sqrt[(d*(-1 + f*x))/(f*(c + d*x))]*Sqrt[(d + d*f*x)/(c*f + d*f*x)]*(EllipticF[I*ArcSinh[Sqrt[-((d + c*f)/f)]]/Sqrt[c + d*x]], (-d + c*f)/(d + c*f)] - EllipticPi[(b*c*f - a*d*f)/(b*d + b*c*f), I*ArcSinh[Sqrt[-((d + c*f)/f)]]/Sqrt[c + d*x]], (-d + c*f)/(d + c*f)))/((-b*c) + a*d)*Sqrt[-((d + c*f)/f)]*Sqrt[1 - f^2*x^2])

Maple [B] time = 0.097, size = 184, normalized size = 2.5

$$-2 \frac{(cf-d)\sqrt{fx+1}\sqrt{-fx+1}\sqrt{dx+c}}{f(ad-bc)(df^2x^3+cf^2x^2-dx-c)} \text{EllipticPi}\left(\sqrt{\frac{(dx+c)f}{cf-d}}, -\frac{b(cf-d)}{f(ad-bc)}, \sqrt{\frac{cf-d}{cf+d}}\right) \sqrt{-\frac{(fx+1)d}{cf-d}} \sqrt{-\frac{(fx-1)d}{cf+d}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(1/(b*x+a)/(d*x+c)^(1/2)/(-f*x+1)^(1/2)/(f*x+1)^(1/2),x)

[Out] -2*(c*f-d)*EllipticPi(((d*x+c)*f/(c*f-d))^(1/2), -(c*f-d)*b/f/(a*d-b*c), ((c*f-d)/(c*f+d))^(1/2))*(-(f*x+1)*d/(c*f-d))^(1/2)*(-(f*x-1)*d/(c*f+d))^(1/2)*((d*x+c)*f/(c*f-d))^(1/2)*(f*x+1)^(1/2)*(-f*x+1)^(1/2)*(d*x+c)^(1/2)/f/(a*d-b*c)/(d*f^2*x^3+c*f^2*x^2-d*x-c)

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx+a)\sqrt{dx+c}\sqrt{fx+1}\sqrt{-fx+1}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(b*x+a)/(d*x+c)^(1/2)/(-f*x+1)^(1/2)/(f*x+1)^(1/2),x, algorithm="maxima")

[Out] integrate(1/((b*x + a)*sqrt(d*x + c)*sqrt(f*x + 1)*sqrt(-f*x + 1)), x)

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(b*x+a)/(d*x+c)^(1/2)/(-f*x+1)^(1/2)/(f*x+1)^(1/2),x, algorithm="fricas")

[Out] Timed out

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(a + bx) \sqrt{c + dx} \sqrt{-fx + 1} \sqrt{fx + 1}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(b*x+a)/(d*x+c)**(1/2)/(-f*x+1)**(1/2)/(f*x+1)**(1/2), x)

[Out] Integral(1/((a + b*x)*sqrt(c + d*x)*sqrt(-f*x + 1)*sqrt(f*x + 1)), x)

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx + a) \sqrt{dx + c} \sqrt{fx + 1} \sqrt{-fx + 1}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(b*x+a)/(d*x+c)^(1/2)/(-f*x+1)^(1/2)/(f*x+1)^(1/2), x, algorithm="giac")

[Out] integrate(1/((b*x + a)*sqrt(d*x + c)*sqrt(f*x + 1)*sqrt(-f*x + 1)), x)

$$3.74 \quad \int \frac{1}{(a+bx)\sqrt{c+dx}\sqrt{1-f^2x^2}} dx$$

Optimal. Leaf size=74

$$\frac{2\sqrt{\frac{f(c+dx)}{cf+d}} \Pi\left(\frac{2b}{b+af}; \sin^{-1}\left(\frac{\sqrt{1-fx}}{\sqrt{2}}\right) \middle| \frac{2d}{d+cf}\right)}{(af+b)\sqrt{c+dx}}$$

[Out] (-2*Sqrt[(f*(c + d*x))/(d + c*f)]*EllipticPi[(2*b)/(b + a*f), ArcSin[Sqrt[1 - f*x]/Sqrt[2]], (2*d)/(d + c*f)])/((b + a*f)*Sqrt[c + d*x])

Rubi [A] time = 0.175884, antiderivative size = 74, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}} = 0.129$, Rules used = {932, 168, 538, 537}

$$\frac{2\sqrt{\frac{f(c+dx)}{cf+d}} \Pi\left(\frac{2b}{b+af}; \sin^{-1}\left(\frac{\sqrt{1-fx}}{\sqrt{2}}\right) \middle| \frac{2d}{d+cf}\right)}{(af+b)\sqrt{c+dx}}$$

Antiderivative was successfully verified.

[In] Int[1/((a + b*x)*Sqrt[c + d*x]*Sqrt[1 - f^2*x^2]),x]

[Out] (-2*Sqrt[(f*(c + d*x))/(d + c*f)]*EllipticPi[(2*b)/(b + a*f), ArcSin[Sqrt[1 - f*x]/Sqrt[2]], (2*d)/(d + c*f)])/((b + a*f)*Sqrt[c + d*x])

Rule 932

Int[1/(((d_.) + (e_.)*(x_))*Sqrt[(f_.) + (g_.)*(x_)]*Sqrt[(a_.) + (c_.)*(x_)^2]), x_Symbol] :> With[{q = Rt[-(c/a), 2]}, Dist[1/Sqrt[a], Int[1/((d + e*x)*Sqrt[f + g*x]*Sqrt[1 - q*x]*Sqrt[1 + q*x]), x], x]] /; FreeQ[{a, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && NeQ[c*d^2 + a*e^2, 0] && GtQ[a, 0]

Rule 168

Int[1/(((a_.) + (b_.)*(x_))*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)^2]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] :> Dist[-2, Subst[Int[1/(Simp[b*c - a*d - b*x^2, x]*Sqrt[Simp[(d*e - c*f)/d + (f*x^2)/d, x]]*Sqrt[Simp[(d*g - c*h)/d + (h*x^2)/d, x]]), x], x, Sqrt[c + d*x]], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x] && GtQ[(d*e - c*f)/d, 0]

Rule 538

```
Int[1/(((a_) + (b_.)*(x_)^2)*Sqrt[(c_) + (d_.)*(x_)^2]*Sqrt[(e_) + (f_.)*(x_)^2]), x_Symbol] := Dist[Sqrt[1 + (d*x^2)/c]/Sqrt[c + d*x^2], Int[1/((a + b*x^2)*Sqrt[1 + (d*x^2)/c]*Sqrt[e + f*x^2]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && !GtQ[c, 0]
```

Rule 537

```
Int[1/(((a_) + (b_.)*(x_)^2)*Sqrt[(c_) + (d_.)*(x_)^2]*Sqrt[(e_) + (f_.)*(x_)^2]), x_Symbol] := Simp[(1*EllipticPi[(b*c)/(a*d), ArcSin[Rt[-(d/c), 2]*x], (c*f)/(d*e))]/(a*Sqrt[c]*Sqrt[e]*Rt[-(d/c), 2]), x] /; FreeQ[{a, b, c, d, e, f}, x] && !GtQ[d/c, 0] && GtQ[c, 0] && GtQ[e, 0] && !( !GtQ[f/e, 0] && SimplerSqrtQ[-(f/e), -(d/c)])
```

Rubi steps

$$\begin{aligned} \int \frac{1}{(a+bx)\sqrt{c+dx}\sqrt{1-f^2x^2}} dx &= \int \frac{1}{(a+bx)\sqrt{c+dx}\sqrt{1-fx}\sqrt{1+fx}} dx \\ &= - \left(2 \operatorname{Subst} \left(\int \frac{1}{\sqrt{2-x^2}(b+af-bx^2)\sqrt{c+\frac{d}{f}-\frac{dx^2}{f}}} dx, x, \sqrt{1-fx} \right) \right) \\ &= - \frac{\left(2\sqrt{\frac{f(c+dx)}{d+cf}} \operatorname{Subst} \left(\int \frac{1}{\sqrt{2-x^2}(b+af-bx^2)\sqrt{1-\frac{dx^2}{\left(\frac{c+d}{f}\right)f}}} dx, x, \sqrt{1-fx} \right) \right)}{\sqrt{c+dx}} \\ &= - \frac{2\sqrt{\frac{f(c+dx)}{d+cf}} \Pi \left(\frac{2b}{b+af}; \sin^{-1} \left(\frac{\sqrt{1-fx}}{\sqrt{2}} \right) \middle| \frac{2d}{d+cf} \right)}{(b+af)\sqrt{c+dx}} \end{aligned}$$

Mathematica [C] time = 0.102766, size = 203, normalized size = 2.74

$$\frac{2i(c+dx)\sqrt{\frac{d(fx-1)}{f(c+dx)}}\sqrt{\frac{dfx+d}{cf+dfx}} \left(\operatorname{EllipticF} \left(i \sinh^{-1} \left(\frac{\sqrt{-\frac{cf+d}{f}}}{\sqrt{c+dx}} \right), \frac{cf-d}{cf+d} \right) - \Pi \left(\frac{bcf-adf}{bd+bcf}; i \sinh^{-1} \left(\frac{\sqrt{\frac{d+cf}{f}}}{\sqrt{c+dx}} \right) \middle| \frac{cf-d}{d+cf} \right) \right)}{\sqrt{1-f^2x^2}\sqrt{-\frac{cf+d}{f}}(ad-bc)}$$

Antiderivative was successfully verified.

[In] Integrate[1/((a + b*x)*Sqrt[c + d*x]*Sqrt[1 - f^2*x^2]),x]

[Out] ((2*I)*(c + d*x)*Sqrt[(d*(-1 + f*x))/(f*(c + d*x))]*Sqrt[(d + d*f*x)/(c*f + d*f*x)]*(EllipticF[I*ArcSinh[Sqrt[-((d + c*f)/f)]]/Sqrt[c + d*x]], (-d + c*f)/(d + c*f)] - EllipticPi[(b*c*f - a*d*f)/(b*d + b*c*f), I*ArcSinh[Sqrt[-((d + c*f)/f)]]/Sqrt[c + d*x]], (-d + c*f)/(d + c*f)))/((-b*c) + a*d)*Sqrt[-((d + c*f)/f)]*Sqrt[1 - f^2*x^2]

Maple [B] time = 0.025, size = 181, normalized size = 2.5

$$-2 \frac{(cf - d) \sqrt{-f^2 x^2 + 1} \sqrt{dx + c}}{(ad - bc) f (df^2 x^3 + cf^2 x^2 - dx - c)} \text{EllipticPi} \left(\sqrt{\frac{(dx + c) f}{cf - d}}, -\frac{(cf - d) b}{(ad - bc) f}, \sqrt{\frac{cf - d}{cf + d}} \right) \sqrt{-\frac{(fx + 1) d}{cf - d}} \sqrt{-\frac{(fx - 1) d}{cf + d}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(1/(b*x+a)/(d*x+c)^(1/2)/(-f^2*x^2+1)^(1/2),x)

[Out] -2*(c*f-d)*EllipticPi(((d*x+c)*f/(c*f-d))^(1/2), -(c*f-d)*b/f/(a*d-b*c), ((c*f-d)/(c*f+d))^(1/2))*(-(f*x+1)*d/(c*f-d))^(1/2)*(-(f*x-1)*d/(c*f+d))^(1/2)*((d*x+c)*f/(c*f-d))^(1/2)*(-f^2*x^2+1)^(1/2)*(d*x+c)^(1/2)/f/(a*d-b*c)/(d*f^2*x^3+c*f^2*x^2-d*x-c)

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{-f^2 x^2 + 1} (bx + a) \sqrt{dx + c}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(b*x+a)/(d*x+c)^(1/2)/(-f^2*x^2+1)^(1/2),x, algorithm="maxima")

[Out] integrate(1/(sqrt(-f^2*x^2 + 1)*(b*x + a)*sqrt(d*x + c)), x)

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate(1/(b*x+a)/(d*x+c)^(1/2)/(-f^2*x^2+1)^(1/2),x, algorithm="fricas")`

[Out] Timed out

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{-(fx-1)(fx+1)}(a+bx)\sqrt{c+dx}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate(1/(b*x+a)/(d*x+c)**(1/2)/(-f**2*x**2+1)**(1/2),x)`

[Out] `Integral(1/(sqrt(-(f*x - 1)*(f*x + 1))*(a + b*x)*sqrt(c + d*x)), x)`

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{-f^2x^2+1}(bx+a)\sqrt{dx+c}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate(1/(b*x+a)/(d*x+c)^(1/2)/(-f^2*x^2+1)^(1/2),x, algorithm="giac")`

[Out] `integrate(1/(sqrt(-f^2*x^2 + 1)*(b*x + a)*sqrt(d*x + c)), x)`

$$3.75 \quad \int \frac{1}{(a+bx)\sqrt{c+dx}\sqrt{1-f^2x}\sqrt{1+f^2x}} dx$$

Optimal. Leaf size=86

$$-\frac{2\sqrt{\frac{f^2(c+dx)}{cf^2+d}} \Pi\left(\frac{2b}{af^2+b}; \sin^{-1}\left(\frac{\sqrt{1-f^2x}}{\sqrt{2}}\right) \middle| \frac{2d}{cf^2+d}\right)}{(af^2+b)\sqrt{c+dx}}$$

[Out] (-2*Sqrt[(f^2*(c + d*x))/(d + c*f^2)]*EllipticPi[(2*b)/(b + a*f^2), ArcSin[Sqrt[1 - f^2*x]/Sqrt[2]], (2*d)/(d + c*f^2)])/((b + a*f^2)*Sqrt[c + d*x])

Rubi [A] time = 0.160048, antiderivative size = 86, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}} = 0.075$, Rules used = {168, 538, 537}

$$-\frac{2\sqrt{\frac{f^2(c+dx)}{cf^2+d}} \Pi\left(\frac{2b}{af^2+b}; \sin^{-1}\left(\frac{\sqrt{1-f^2x}}{\sqrt{2}}\right) \middle| \frac{2d}{cf^2+d}\right)}{(af^2+b)\sqrt{c+dx}}$$

Antiderivative was successfully verified.

[In] Int[1/((a + b*x)*Sqrt[c + d*x]*Sqrt[1 - f^2*x]*Sqrt[1 + f^2*x]),x]

[Out] (-2*Sqrt[(f^2*(c + d*x))/(d + c*f^2)]*EllipticPi[(2*b)/(b + a*f^2), ArcSin[Sqrt[1 - f^2*x]/Sqrt[2]], (2*d)/(d + c*f^2)])/((b + a*f^2)*Sqrt[c + d*x])

Rule 168

Int[1/(((a_.) + (b_.)*(x_))*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Dist[-2, Subst[Int[1/(Simp[b*c - a*d - b*x^2, x]*Sqrt[Simp[(d*e - c*f)/d + (f*x^2)/d, x]]*Sqrt[Simp[(d*g - c*h)/d + (h*x^2)/d, x]]), x], x, Sqrt[c + d*x]], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x] && GtQ[(d*e - c*f)/d, 0]

Rule 538

Int[1/(((a_.) + (b_.)*(x_)^2)*Sqrt[(c_.) + (d_.)*(x_)^2]*Sqrt[(e_.) + (f_.)*(x_)^2]), x_Symbol] := Dist[Sqrt[1 + (d*x^2)/c]/Sqrt[c + d*x^2], Int[1/((a + b*x^2)*Sqrt[1 + (d*x^2)/c]*Sqrt[e + f*x^2]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && !GtQ[c, 0]

Rule 537

Int[1/(((a_) + (b_.)*(x_)^2)*Sqrt[(c_) + (d_.)*(x_)^2]*Sqrt[(e_) + (f_.)*(x_)^2]), x_Symbol] :> Simp[(1*EllipticPi[(b*c)/(a*d), ArcSin[Rt[-(d/c), 2]*x], (c*f)/(d*e)])/(a*Sqrt[c]*Sqrt[e]*Rt[-(d/c), 2]), x] /; FreeQ[{a, b, c, d, e, f}, x] && !GtQ[d/c, 0] && GtQ[c, 0] && GtQ[e, 0] && !(!GtQ[f/e, 0] && SimplerSqrtQ[-(f/e), -(d/c)])

Rubi steps

$$\int \frac{1}{(a+bx)\sqrt{c+dx}\sqrt{1-f^2x}\sqrt{1+f^2x}} dx = - \left(2 \text{Subst} \left[\int \frac{1}{\sqrt{2-x^2}(b+af^2-bx^2)\sqrt{c+\frac{d}{f^2}-\frac{dx^2}{f^2}}} dx, x, \sqrt{1-f^2x} \right] \right)$$

$$= - \frac{\left(2\sqrt{\frac{f^2(c+dx)}{d+cf^2}} \text{Subst} \left[\int \frac{1}{\sqrt{2-x^2}(b+af^2-bx^2)\sqrt{1-\frac{dx^2}{(c+\frac{d}{f^2})f^2}}} dx, x, \sqrt{1-f^2x} \right] \right)}{\sqrt{c+dx}}$$

$$= - \frac{2\sqrt{\frac{f^2(c+dx)}{d+cf^2}} \Pi\left(\frac{2b}{b+af^2}; \sin^{-1}\left(\frac{\sqrt{1-f^2x}}{\sqrt{2}}\right) \Big|_{d+cf^2}\right)}{(b+af^2)\sqrt{c+dx}}$$

Mathematica [C] time = 0.812583, size = 218, normalized size = 2.53

$$\frac{2i(c+dx)\sqrt{\frac{d(f^2x-1)}{f^2(c+dx)}}\sqrt{\frac{d(f^2x+1)}{f^2(c+dx)}}\left(\text{EllipticF}\left(i\sinh^{-1}\left(\frac{\sqrt{-c-\frac{d}{f^2}}}{\sqrt{c+dx}}\right), \frac{cf^2-d}{cf^2+d}\right) - \Pi\left(\frac{(bc-ad)f^2}{b(cf^2+d)}; i\sinh^{-1}\left(\frac{\sqrt{-c-\frac{d}{f^2}}}{\sqrt{c+dx}}\right) \Big|_{cf^2+d}\right)\right)}{\sqrt{1-f^4x^2}\sqrt{-c-\frac{d}{f^2}}(ad-bc)}$$

Antiderivative was successfully verified.

[In] Integrate[1/((a + b*x)*Sqrt[c + d*x]*Sqrt[1 - f^2*x]*Sqrt[1 + f^2*x]),x]

[Out] ((2*I)*(c + d*x)*Sqrt[(d*(-1 + f^2*x))/(f^2*(c + d*x))]*Sqrt[(d*(1 + f^2*x))/(f^2*(c + d*x))]*(EllipticF[I*ArcSinh[Sqrt[-c - d/f^2]/Sqrt[c + d*x]], (-d + c*f^2)/(d + c*f^2)] - EllipticPi[((b*c - a*d)*f^2)/(b*(d + c*f^2)), I*ArcSinh[Sqrt[-c - d/f^2]/Sqrt[c + d*x]], (-d + c*f^2)/(d + c*f^2)]))/((-b*c

) + a*d)*Sqrt[-c - d/f^2]*Sqrt[1 - f^4*x^2])

Maple [B] time = 0.096, size = 212, normalized size = 2.5

$$-2 \frac{(cf^2 - d) \sqrt{f^2x + 1} \sqrt{-f^2x + 1} \sqrt{dx + c}}{f^2(ad - bc)(df^4x^3 + cf^4x^2 - dx - c)} \text{EllipticPi} \left(\sqrt{\frac{f^2(dx + c)}{cf^2 - d}}, -\frac{b(cf^2 - d)}{f^2(ad - bc)}, \sqrt{\frac{cf^2 - d}{cf^2 + d}} \right) \sqrt{-\frac{(f^2x + 1)d}{cf^2 - d}} \sqrt{-\frac{(f^2x - 1)d}{cf^2 - d}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(1/(b*x+a)/(d*x+c)^(1/2)/(-f^2*x+1)^(1/2)/(f^2*x+1)^(1/2),x)

[Out] -2*(c*f^2-d)*EllipticPi(((d*x+c)*f^2/(c*f^2-d))^(1/2), -(c*f^2-d)*b/f^2/(a*d-b*c), ((c*f^2-d)/(c*f^2+d))^(1/2))*(-(f^2*x+1)*d/(c*f^2-d))^(1/2)*(-(f^2*x-1)*d/(c*f^2+d))^(1/2)*((d*x+c)*f^2/(c*f^2-d))^(1/2)*(f^2*x+1)^(1/2)*(-(f^2*x+1)^(1/2)*(d*x+c)^(1/2)/f^2/(a*d-b*c)/(d*f^4*x^3+c*f^4*x^2-d*x-c)

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{f^2x + 1} \sqrt{-f^2x + 1} (bx + a) \sqrt{dx + c}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(b*x+a)/(d*x+c)^(1/2)/(-f^2*x+1)^(1/2)/(f^2*x+1)^(1/2),x, algorithm="maxima")

[Out] integrate(1/(sqrt(f^2*x + 1)*sqrt(-f^2*x + 1)*(b*x + a)*sqrt(d*x + c)), x)

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(b*x+a)/(d*x+c)^(1/2)/(-f^2*x+1)^(1/2)/(f^2*x+1)^(1/2),x, algorithm="fricas")

[Out] Timed out

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(a + bx) \sqrt{c + dx} \sqrt{-f^2x + 1} \sqrt{f^2x + 1}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(b*x+a)/(d*x+c)**(1/2)/(-f**2*x+1)**(1/2)/(f**2*x+1)**(1/2),x)

[Out] Integral(1/((a + b*x)*sqrt(c + d*x)*sqrt(-f**2*x + 1)*sqrt(f**2*x + 1)), x)

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{f^2x + 1} \sqrt{-f^2x + 1} (bx + a) \sqrt{dx + c}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(b*x+a)/(d*x+c)^(1/2)/(-f^2*x+1)^(1/2)/(f^2*x+1)^(1/2),x, algorithm="giac")

[Out] integrate(1/(sqrt(f^2*x + 1)*sqrt(-f^2*x + 1)*(b*x + a)*sqrt(d*x + c)), x)

$$3.76 \quad \int \frac{1}{(a+bx)\sqrt{c+dx}\sqrt{1-f^4x^2}} dx$$

Optimal. Leaf size=86

$$-\frac{2\sqrt{\frac{f^2(c+dx)}{cf^2+d}} \Pi\left(\frac{2b}{af^2+b}; \sin^{-1}\left(\frac{\sqrt{1-f^2x}}{\sqrt{2}}\right) \middle| \frac{2d}{cf^2+d}\right)}{(af^2+b)\sqrt{c+dx}}$$

[Out] (-2*Sqrt[(f^2*(c + d*x))/(d + c*f^2)]*EllipticPi[(2*b)/(b + a*f^2), ArcSin[Sqrt[1 - f^2*x]/Sqrt[2]], (2*d)/(d + c*f^2)])/((b + a*f^2)*Sqrt[c + d*x])

Rubi [A] time = 0.174857, antiderivative size = 86, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}} = 0.129$, Rules used = {932, 168, 538, 537}

$$-\frac{2\sqrt{\frac{f^2(c+dx)}{cf^2+d}} \Pi\left(\frac{2b}{af^2+b}; \sin^{-1}\left(\frac{\sqrt{1-f^2x}}{\sqrt{2}}\right) \middle| \frac{2d}{cf^2+d}\right)}{(af^2+b)\sqrt{c+dx}}$$

Antiderivative was successfully verified.

[In] Int[1/((a + b*x)*Sqrt[c + d*x]*Sqrt[1 - f^4*x^2]),x]

[Out] (-2*Sqrt[(f^2*(c + d*x))/(d + c*f^2)]*EllipticPi[(2*b)/(b + a*f^2), ArcSin[Sqrt[1 - f^2*x]/Sqrt[2]], (2*d)/(d + c*f^2)])/((b + a*f^2)*Sqrt[c + d*x])

Rule 932

Int[1/(((d_.) + (e_.)*(x_))*Sqrt[(f_.) + (g_.)*(x_)]*Sqrt[(a_.) + (c_.)*(x_)^2]), x_Symbol] := With[{q = Rt[-(c/a), 2]}, Dist[1/Sqrt[a], Int[1/((d + e*x)*Sqrt[f + g*x]*Sqrt[1 - q*x]*Sqrt[1 + q*x]), x], x] /; FreeQ[{a, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && NeQ[c*d^2 + a*e^2, 0] && GtQ[a, 0]

Rule 168

Int[1/(((a_.) + (b_.)*(x_))*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)^2]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Dist[-2, Subst[Int[1/(Simp[b*c - a*d - b*x^2, x]*Sqrt[Simp[(d*e - c*f)/d + (f*x^2)/d, x]]*Sqrt[Simp[(d*g - c*h)/d + (h*x^2)/d, x]]), x], x, Sqrt[c + d*x]], x] /; FreeQ[{a, b, c, d, e

, f, g, h}, x] && GtQ[(d*e - c*f)/d, 0]

Rule 538

Int[1/(((a_) + (b_.)*(x_)^2)*Sqrt[(c_) + (d_.)*(x_)^2]*Sqrt[(e_) + (f_.)*(x_)^2]), x_Symbol] := Dist[Sqrt[1 + (d*x^2)/c]/Sqrt[c + d*x^2], Int[1/((a + b*x^2)*Sqrt[1 + (d*x^2)/c]*Sqrt[e + f*x^2]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && !GtQ[c, 0]

Rule 537

Int[1/(((a_) + (b_.)*(x_)^2)*Sqrt[(c_) + (d_.)*(x_)^2]*Sqrt[(e_) + (f_.)*(x_)^2]), x_Symbol] := Simp[(1*EllipticPi[(b*c)/(a*d), ArcSin[Rt[-(d/c), 2]*x], (c*f)/(d*e))]/(a*Sqrt[c]*Sqrt[e]*Rt[-(d/c), 2]), x] /; FreeQ[{a, b, c, d, e, f}, x] && !GtQ[d/c, 0] && GtQ[c, 0] && GtQ[e, 0] && !(!GtQ[f/e, 0] && SimplerSqrtQ[-(f/e), -(d/c)])

Rubi steps

$$\begin{aligned} \int \frac{1}{(a+bx)\sqrt{c+dx}\sqrt{1-f^2x^2}} dx &= \int \frac{1}{(a+bx)\sqrt{c+dx}\sqrt{1-f^2x}\sqrt{1+f^2x}} dx \\ &= - \left(2 \operatorname{Subst} \left(\int \frac{1}{\sqrt{2-x^2}(b+af^2-bx^2)\sqrt{c+\frac{d}{f^2}-\frac{dx^2}{f^2}}} dx, x, \sqrt{1-f^2x} \right) \right) \\ &= - \frac{\left(2\sqrt{\frac{f^2(c+dx)}{d+cf^2}} \operatorname{Subst} \left(\int \frac{1}{\sqrt{2-x^2}(b+af^2-bx^2)\sqrt{1-\frac{dx^2}{\left(\frac{c+d}{f^2}\right)f^2}}} dx, x, \sqrt{1-f^2x} \right) \right)}{\sqrt{c+dx}} \\ &= - \frac{2\sqrt{\frac{f^2(c+dx)}{d+cf^2}} \Pi \left(\frac{2b}{b+af^2}; \sin^{-1} \left(\frac{\sqrt{1-f^2x}}{\sqrt{2}} \right) \middle| \frac{2d}{d+cf^2} \right)}{(b+af^2)\sqrt{c+dx}} \end{aligned}$$

Mathematica [C] time = 0.107044, size = 218, normalized size = 2.53

$$\frac{2i(c+dx)\sqrt{\frac{d(f^2x-1)}{f^2(c+dx)}}\sqrt{\frac{d(f^2x+1)}{f^2(c+dx)}} \left(\operatorname{EllipticF} \left(i \sinh^{-1} \left(\frac{\sqrt{-c-\frac{d}{f^2}}}{\sqrt{c+dx}} \right), \frac{cf^2-d}{cf^2+d} \right) - \Pi \left(\frac{(bc-ad)f^2}{b(cf^2+d)}; i \sinh^{-1} \left(\frac{\sqrt{-c-\frac{d}{f^2}}}{\sqrt{c+dx}} \right) \middle| \frac{cf^2-d}{cf^2+d} \right) \right)}{\sqrt{1-f^4x^2}\sqrt{-c-\frac{d}{f^2}}(ad-bc)}$$

Antiderivative was successfully verified.

[In] Integrate[1/((a + b*x)*Sqrt[c + d*x]*Sqrt[1 - f^4*x^2]),x]

[Out] ((2*I)*(c + d*x)*Sqrt[(d*(-1 + f^2*x))/(f^2*(c + d*x))]*Sqrt[(d*(1 + f^2*x))/(f^2*(c + d*x))]*(EllipticF[I*ArcSinh[Sqrt[-c - d/f^2]/Sqrt[c + d*x]], (-d + c*f^2)/(d + c*f^2)] - EllipticPi[((b*c - a*d)*f^2)/(b*(d + c*f^2)), I*ArcSinh[Sqrt[-c - d/f^2]/Sqrt[c + d*x]], (-d + c*f^2)/(d + c*f^2)]))/((-b*c) + a*d)*Sqrt[-c - d/f^2]*Sqrt[1 - f^4*x^2])

Maple [B] time = 0.024, size = 205, normalized size = 2.4

$$-2 \frac{(cf^2 - d) \sqrt{-f^4x^2 + 1} \sqrt{dx + c}}{(ad - bc) f^2 (df^4x^3 + cf^4x^2 - dx - c)} \text{EllipticPi} \left(\sqrt{\frac{f^2(dx + c)}{cf^2 - d}}, -\frac{(cf^2 - d)b}{(ad - bc)f^2} \sqrt{\frac{cf^2 - d}{cf^2 + d}} \sqrt{-\frac{(f^2x + 1)d}{cf^2 - d}} \sqrt{-\frac{(f^2x - 1)d}{cf^2 - d}} \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(1/(b*x+a)/(d*x+c)^(1/2)/(-f^4*x^2+1)^(1/2),x)

[Out] -2*(c*f^2-d)*EllipticPi(((d*x+c)*f^2/(c*f^2-d))^(1/2), -(c*f^2-d)*b/f^2/(a*d-b*c), ((c*f^2-d)/(c*f^2+d))^(1/2))*(-(f^2*x+1)*d/(c*f^2-d))^(1/2))*(-(f^2*x-1)*d/(c*f^2+d))^(1/2))*((d*x+c)*f^2/(c*f^2-d))^(1/2))*(-f^4*x^2+1)^(1/2)*(d*x+c)^(1/2)/f^2/(a*d-b*c)/(d*f^4*x^3+c*f^4*x^2-d*x-c)

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{-f^4x^2 + 1}(bx + a)\sqrt{dx + c}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(b*x+a)/(d*x+c)^(1/2)/(-f^4*x^2+1)^(1/2),x, algorithm="maxima")

[Out] integrate(1/(sqrt(-f^4*x^2 + 1)*(b*x + a)*sqrt(d*x + c)), x)

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(b*x+a)/(d*x+c)^(1/2)/(-f^4*x^2+1)^(1/2),x, algorithm="fricas")

[Out] Timed out

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{-(f^2x-1)(f^2x+1)}(a+bx)\sqrt{c+dx}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(b*x+a)/(d*x+c)**(1/2)/(-f**4*x**2+1)**(1/2),x)

[Out] Integral(1/(sqrt(-(f**2*x - 1)*(f**2*x + 1))*(a + b*x)*sqrt(c + d*x)), x)

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{-f^4x^2+1}(bx+a)\sqrt{dx+c}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(b*x+a)/(d*x+c)^(1/2)/(-f^4*x^2+1)^(1/2),x, algorithm="giac")

[Out] integrate(1/(sqrt(-f^4*x^2 + 1)*(b*x + a)*sqrt(d*x + c)), x)

$$3.77 \quad \int \sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^{5/2} dx$$

Optimal. Leaf size=471

$$\frac{245264762213\sqrt{\frac{11}{23}}\sqrt{5x+7}\text{EllipticF}\left(\tan^{-1}\left(\frac{\sqrt{4x+1}}{\sqrt{2}\sqrt{2-3x}}\right), -\frac{39}{23}\right)}{99532800\sqrt{2x-5}\sqrt{\frac{5x+7}{5-2x}}} + \frac{1}{25}\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}(5x+7)^{7/2} - \frac{427\sqrt{2-3x}}{34560}$$

```
[Out] (-1450582567*Sqrt[2 - 3*x]*Sqrt[1 + 4*x]*Sqrt[7 + 5*x])/(3686400*Sqrt[-5 + 2*x]) - (70489981*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*Sqrt[7 + 5*x])/1658880 - (83363*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(7 + 5*x)^(3/2))/34560 - (427*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(7 + 5*x)^(5/2))/2400 + (Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(7 + 5*x)^(7/2))/25 + (1450582567*Sqrt[143/3]*Sqrt[2 - 3*x]*Sqrt[(7 + 5*x)/(5 - 2*x)]*EllipticE[ArcSin[(Sqrt[39/23]*Sqrt[1 + 4*x])/Sqrt[-5 + 2*x]], -23/39])/(2457600*Sqrt[(2 - 3*x)/(5 - 2*x)]*Sqrt[7 + 5*x]) - (245264762213*Sqrt[11/23]*Sqrt[7 + 5*x]*EllipticF[ArcTan[Sqrt[1 + 4*x]/(Sqrt[2]*Sqrt[2 - 3*x])], -39/23])/(99532800*Sqrt[-5 + 2*x]*Sqrt[(7 + 5*x)/(5 - 2*x)]) - (57691792727443*(2 - 3*x)*Sqrt[(5 - 2*x)/(2 - 3*x)]*Sqrt[-((1 + 4*x)/(2 - 3*x))]*EllipticPi[-69/55, ArcSin[(Sqrt[11/23]*Sqrt[7 + 5*x])/Sqrt[2 - 3*x]], -23/39])/(497664000*Sqrt[429]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])
```

Rubi [A] time = 0.665089, antiderivative size = 471, normalized size of antiderivative = 1., number of steps used = 12, number of rules used = 10, integrand size = 37, $\frac{\text{number of rules}}{\text{integrand size}} = 0.27$, Rules used = {161, 1600, 1602, 1598, 170, 418, 165, 537, 176, 424}

$$\frac{1}{25}\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}(5x+7)^{7/2} - \frac{427\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}(5x+7)^{5/2}}{2400} - \frac{83363\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}(5x+7)^{3/2}}{34560}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(7 + 5*x)^(5/2), x]
```

```
[Out] (-1450582567*Sqrt[2 - 3*x]*Sqrt[1 + 4*x]*Sqrt[7 + 5*x])/(3686400*Sqrt[-5 + 2*x]) - (70489981*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*Sqrt[7 + 5*x])/1658880 - (83363*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(7 + 5*x)^(3/2))/34560 - (427*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(7 + 5*x)^(5/2))/2400 + (Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(7 + 5*x)^(7/2))/25 + (
```

```

1450582567*sqrt[143/3]*sqrt[2 - 3*x]*sqrt[(7 + 5*x)/(5 - 2*x)]*EllipticE[ArcSin[(sqrt[39/23]*sqrt[1 + 4*x])/sqrt[-5 + 2*x]], -23/39]/(2457600*sqrt[(2 - 3*x)/(5 - 2*x)]*sqrt[7 + 5*x]) - (245264762213*sqrt[11/23]*sqrt[7 + 5*x]*EllipticF[ArcTan[sqrt[1 + 4*x]/(sqrt[2]*sqrt[2 - 3*x])], -39/23]/(9953280*sqrt[-5 + 2*x]*sqrt[(7 + 5*x)/(5 - 2*x])) - (57691792727443*(2 - 3*x)*sqrt[(5 - 2*x)/(2 - 3*x)]*sqrt[-((1 + 4*x)/(2 - 3*x))]*EllipticPi[-69/55, ArcSin[(sqrt[11/23]*sqrt[7 + 5*x])/sqrt[2 - 3*x]], -23/39]/(497664000*sqrt[429]*sqrt[-5 + 2*x]*sqrt[1 + 4*x])

```

Rule 161

```

Int[((a_.) + (b_.)*(x_))^(m_)*sqrt[(c_.) + (d_.)*(x_)]*sqrt[(e_.) + (f_.)*(x_)]*sqrt[(g_.) + (h_.)*(x_)], x_Symbol] := Simp[(2*(a + b*x)^(m + 1)*sqrt[c + d*x]*sqrt[e + f*x]*sqrt[g + h*x])/(b*(2*m + 5)), x] + Dist[1/(b*(2*m + 5)), Int[((a + b*x)^m*Simp[3*b*c*e*g - a*(d*e*g + c*f*g + c*e*h) + 2*(b*(d*e*g + c*f*g + c*e*h) - a*(d*f*g + d*e*h + c*f*h))*x - (3*a*d*f*h - b*(d*f*g + d*e*h + c*f*h))*x^2, x])/(sqrt[c + d*x]*sqrt[e + f*x]*sqrt[g + h*x]), x] /; FreeQ[{a, b, c, d, e, f, g, h, m}, x] && IntegerQ[2*m] && !LtQ[m, -1]

```

Rule 1600

```

Int[(((a_.) + (b_.)*(x_))^(m_.)*((A_.) + (B_.)*(x_) + (C_.)*(x_)^2))/(sqrt[(c_.) + (d_.)*(x_)]*sqrt[(e_.) + (f_.)*(x_)]*sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Simp[(2*C*(a + b*x)^m*sqrt[c + d*x]*sqrt[e + f*x]*sqrt[g + h*x])/(d*f*h*(2*m + 3)), x] + Dist[1/(d*f*h*(2*m + 3)), Int[((a + b*x)^(m - 1)/(sqrt[c + d*x]*sqrt[e + f*x]*sqrt[g + h*x]))*Simp[a*A*d*f*h*(2*m + 3) - C*(a*(d*e*g + c*f*g + c*e*h) + 2*b*c*e*g*m) + ((A*b + a*B)*d*f*h*(2*m + 3) - C*(2*a*(d*f*g + d*e*h + c*f*h) + b*(2*m + 1)*(d*e*g + c*f*g + c*e*h)))*x + (b*B*d*f*h*(2*m + 3) + 2*C*(a*d*f*h*m - b*(m + 1)*(d*f*g + d*e*h + c*f*h)))*x^2, x], x] /; FreeQ[{a, b, c, d, e, f, g, h, A, B, C}, x] && IntegerQ[2*m] && GtQ[m, 0]

```

Rule 1602

```

Int[((A_.) + (B_.)*(x_) + (C_.)*(x_)^2)/(sqrt[(a_.) + (b_.)*(x_)]*sqrt[(c_.) + (d_.)*(x_)]*sqrt[(e_.) + (f_.)*(x_)]*sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Simp[(C*sqrt[a + b*x]*sqrt[e + f*x]*sqrt[g + h*x])/(b*f*h*sqrt[c + d*x]), x] + (Dist[1/(2*b*d*f*h), Int[(1*Simp[2*A*b*d*f*h - C*(b*d*e*g + a*c*f*h) + (2*b*B*d*f*h - C*(a*d*f*h + b*(d*f*g + d*e*h + c*f*h)))*x, x])/(sqrt[a + b*x]*sqrt[c + d*x]*sqrt[e + f*x]*sqrt[g + h*x]), x], x] + Dist[(C*(d*e - c*f)*(d*g - c*h))/(2*b*d*f*h), Int[Sqrt[a + b*x]/((c + d*x)^(3/2)*sqrt[e + f*x]*sqrt[g + h*x]), x], x] /; FreeQ[{a, b, c, d, e, f, g, h, A, B, C}, x]

```

Rule 1598

```
Int[((A_.) + (B_.)*(x_))/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]
*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Dist[(A*b
- a*B)/b, Int[1/(Sqrt[a + b*x]*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]),
x], x] + Dist[B/b, Int[Sqrt[a + b*x]/(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g +
h*x]), x], x] /; FreeQ[{a, b, c, d, e, f, g, h, A, B}, x]
```

Rule 170

```
Int[1/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)
*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Dist[(2*Sqrt[g + h*x]*Sqrt[(
(b*e - a*f)*(c + d*x))/((d*e - c*f)*(a + b*x))])/((f*g - e*h)*Sqrt[c + d*x]
*Sqrt[-((b*e - a*f)*(g + h*x))/((f*g - e*h)*(a + b*x))]), Subst[Int[1/(Sq
rt[1 + ((b*c - a*d)*x^2)/(d*e - c*f)]*Sqrt[1 - ((b*g - a*h)*x^2)/(f*g - e*h
)]), x], x, Sqrt[e + f*x]/Sqrt[a + b*x]], x] /; FreeQ[{a, b, c, d, e, f, g,
h}, x]
```

Rule 418

```
Int[1/(Sqrt[(a_) + (b_.)*(x_)^2]*Sqrt[(c_) + (d_.)*(x_)^2]), x_Symbol] := S
imp[(Sqrt[a + b*x^2]*EllipticF[ArcTan[Rt[d/c, 2]*x], 1 - (b*c)/(a*d)])/(a*R
t[d/c, 2]*Sqrt[c + d*x^2]*Sqrt[(c*(a + b*x^2))/(a*(c + d*x^2))]), x] /; Fre
eQ[{a, b, c, d}, x] && PosQ[d/c] && PosQ[b/a] && !SimplerSqrtQ[b/a, d/c]
```

Rule 165

```
Int[Sqrt[(a_.) + (b_.)*(x_)]/(Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(
x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Dist[(2*(a + b*x)*Sqrt[((b*g -
a*h)*(c + d*x))/((d*g - c*h)*(a + b*x))]*Sqrt[((b*g - a*h)*(e + f*x))/((f*
g - e*h)*(a + b*x))])/((Sqrt[c + d*x]*Sqrt[e + f*x]), Subst[Int[1/((h - b*x^
2)*Sqrt[1 + ((b*c - a*d)*x^2)/(d*g - c*h)]*Sqrt[1 + ((b*e - a*f)*x^2)/(f*g
- e*h)]), x], x, Sqrt[g + h*x]/Sqrt[a + b*x]], x] /; FreeQ[{a, b, c, d, e,
f, g, h}, x]
```

Rule 537

```
Int[1/(((a_) + (b_.)*(x_)^2)*Sqrt[(c_) + (d_.)*(x_)^2]*Sqrt[(e_) + (f_.)*(x
_)^2]), x_Symbol] := Simp[(1*EllipticPi[(b*c)/(a*d), ArcSin[Rt[-(d/c), 2]*x
], (c*f)/(d*e))]/(a*Sqrt[c]*Sqrt[e]*Rt[-(d/c), 2]), x] /; FreeQ[{a, b, c, d
, e, f}, x] && !GtQ[d/c, 0] && GtQ[c, 0] && GtQ[e, 0] && !( !GtQ[f/e, 0]
&& SimplerSqrtQ[-(f/e), -(d/c)])
```

Rule 176


```

Int[Sqrt[(c_.) + (d_.)*(x_)]/(((a_.) + (b_.)*(x_))^(3/2)*Sqrt[(e_.) + (f_.)
*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Dist[(-2*Sqrt[c + d*x]*Sqrt[
-(((b*e - a*f)*(g + h*x))/((f*g - e*h)*(a + b*x))))]/((b*e - a*f)*Sqrt[g +
h*x]*Sqrt[((b*e - a*f)*(c + d*x))/((d*e - c*f)*(a + b*x))]), Subst[Int[Sqrt
[1 + ((b*c - a*d)*x^2)/(d*e - c*f)]/Sqrt[1 - ((b*g - a*h)*x^2)/(f*g - e*h)]
, x], x, Sqrt[e + f*x]/Sqrt[a + b*x]], x] /; FreeQ[{a, b, c, d, e, f, g, h}
, x]

```

Rule 424

```

Int[Sqrt[(a_) + (b_.)*(x_)^2]/Sqrt[(c_) + (d_.)*(x_)^2], x_Symbol] := Simp[
(Sqrt[a]*EllipticE[ArcSin[Rt[-(d/c), 2]*x], (b*c)/(a*d)]/(Sqrt[c]*Rt[-(d/c
), 2]), x] /; FreeQ[{a, b, c, d}, x] && NegQ[d/c] && GtQ[c, 0] && GtQ[a, 0]

```

Rubi steps

$$\begin{aligned}
\int \sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^{5/2} dx &= \frac{1}{25} \sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^{7/2} + \frac{1}{50} \int \frac{(7+5x)^{5/2}(-3-1190x+)}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}} dx \\
&= -\frac{427\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^{5/2}}{2400} + \frac{1}{25} \sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x} \\
&= -\frac{83363\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^{3/2}}{34560} - \frac{427\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{2400} \\
&= -\frac{70489981\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}\sqrt{7+5x}}{1658880} - \frac{83363\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{34560} \\
&= -\frac{1450582567\sqrt{2-3x}\sqrt{1+4x}\sqrt{7+5x}}{3686400\sqrt{-5+2x}} - \frac{70489981\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{1658880} \\
&= -\frac{1450582567\sqrt{2-3x}\sqrt{1+4x}\sqrt{7+5x}}{3686400\sqrt{-5+2x}} - \frac{70489981\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{1658880} \\
&= -\frac{1450582567\sqrt{2-3x}\sqrt{1+4x}\sqrt{7+5x}}{3686400\sqrt{-5+2x}} - \frac{70489981\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{1658880} \\
&= -\frac{1450582567\sqrt{2-3x}\sqrt{1+4x}\sqrt{7+5x}}{3686400\sqrt{-5+2x}} - \frac{70489981\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{1658880}
\end{aligned}$$

Mathematica [A] time = 4.38093, size = 350, normalized size = 0.74

$$\sqrt{2x-5}\sqrt{4x+1} \left(-62507925572\sqrt{682}\sqrt{\frac{8x^2-18x-5}{(2-3x)^2}} (15x^2+11x-14) \text{EllipticF} \left(\sin^{-1} \left(\sqrt{\frac{31}{39}} \sqrt{\frac{2x-5}{3x-2}} \right), \frac{39}{62} \right) + 7833145861 \right)$$

Warning: Unable to verify antiderivative.

[In] Integrate[Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(7 + 5*x)^(5/2), x]

[Out] -(Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(78331458618*Sqrt[682]*Sqrt[(-5 - 18*x + 8*x^2)/(2 - 3*x)^2]*(-14 + 11*x + 15*x^2)*EllipticE[ArcSin[Sqrt[31/39]*Sqrt[(-

$$\begin{aligned} & 5 + 2x)/(-2 + 3x)]], 39/62] - 62507925572*\text{Sqrt}[682]*\text{Sqrt}[(-5 - 18*x + 8*x \\ & ^2)/(2 - 3*x)^2]*(-14 + 11*x + 15*x^2)*\text{EllipticF}[\text{ArcSin}[\text{Sqrt}[31/39]*\text{Sqrt}[(- \\ & 5 + 2*x)/(-2 + 3*x)]], 39/62] + \text{Sqrt}[(7 + 5*x)/(-2 + 3*x)]*(6*(111823466541 \\ & 5 + 5225923788019*x + 2861488598626*x^2 - 795166559320*x^3 - 849459145920*x \\ & ^4 - 288728294400*x^5 + 71414784000*x^6 + 39813120000*x^7) - 60033082963*\text{Sq} \\ & \text{rt}[682]*(2 - 3*x)^2*\text{Sqrt}[(1 + 4*x)/(-2 + 3*x)]*\text{Sqrt}[(-35 - 11*x + 10*x^2)/(\\ & 2 - 3*x)^2]*\text{EllipticPi}[117/62, \text{ArcSin}[\text{Sqrt}[31/39]*\text{Sqrt}[(-5 + 2*x)/(-2 + 3*x \\ &)]], 39/62]))/(398131200*\text{Sqrt}[2 - 3*x]*\text{Sqrt}[7 + 5*x]*\text{Sqrt}[(7 + 5*x)/(-2 + \\ & 3*x)]*(-5 - 18*x + 8*x^2)) \end{aligned}$$

Maple [B] time = 0.074, size = 895, normalized size = 1.9

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] $\text{int}((7+5*x)^{(5/2)}*(2-3*x)^{(1/2)}*(2*x-5)^{(1/2)}*(4*x+1)^{(1/2)}, x)$

[Out] $\begin{aligned} & 1/284663808000*(7+5*x)^{(1/2)}*(2-3*x)^{(1/2)}*(2*x-5)^{(1/2)}*(4*x+1)^{(1/2)}*(624 \\ & 33731183120*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}*3^{(1/2)}*13^{(1/2)}*((2*x-5)/(4*x \\ & +1))^{(1/2)}*((-2+3*x)/(4*x+1))^{(1/2)}*x^2*\text{EllipticF}(1/31*31^{(1/2)}*11^{(1/2)}*((\\ & 7+5*x)/(4*x+1))^{(1/2)}, 1/39*31^{(1/2)}*78^{(1/2)})-684857410441904*11^{(1/2)}*((7+ \\ & 5*x)/(4*x+1))^{(1/2)}*3^{(1/2)}*13^{(1/2)}*((2*x-5)/(4*x+1))^{(1/2)}*((-2+3*x)/(4*x \\ & +1))^{(1/2)}*x^2*\text{EllipticPi}(1/31*31^{(1/2)}*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}, 12 \\ & 4/55, 1/39*31^{(1/2)}*78^{(1/2)})-896111886589920*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/ \\ & 2)}*3^{(1/2)}*13^{(1/2)}*((2*x-5)/(4*x+1))^{(1/2)}*((-2+3*x)/(4*x+1))^{(1/2)}*x^2*\text{El} \\ & \text{lipticE}(1/31*31^{(1/2)}*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}, 1/39*31^{(1/2)}*78^{(1/ \\ & 2)})+31216865591560*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}*3^{(1/2)}*13^{(1/2)}*((2*x- \\ & 5)/(4*x+1))^{(1/2)}*((-2+3*x)/(4*x+1))^{(1/2)}*x*\text{EllipticF}(1/31*31^{(1/2)}*11^{(1/ \\ & 2)}*((7+5*x)/(4*x+1))^{(1/2)}, 1/39*31^{(1/2)}*78^{(1/2)})-342428705220952*11^{(1/2)} \\ & *((7+5*x)/(4*x+1))^{(1/2)}*3^{(1/2)}*13^{(1/2)}*((2*x-5)/(4*x+1))^{(1/2)}*((-2+3*x) \\ & / (4*x+1))^{(1/2)}*x*\text{EllipticPi}(1/31*31^{(1/2)}*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)} \\ & , 124/55, 1/39*31^{(1/2)}*78^{(1/2)})-448055943294960*11^{(1/2)}*((7+5*x)/(4*x+1))^{(\\ & 1/2)}*3^{(1/2)}*13^{(1/2)}*((2*x-5)/(4*x+1))^{(1/2)}*((-2+3*x)/(4*x+1))^{(1/2)}*x*\text{E} \\ & \text{llipticE}(1/31*31^{(1/2)}*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}, 1/39*31^{(1/2)}*78^{(1 \\ & /2)})+3902108198945*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}*3^{(1/2)}*13^{(1/2)}*((2*x- \\ & 5)/(4*x+1))^{(1/2)}*((-2+3*x)/(4*x+1))^{(1/2)}*\text{EllipticF}(1/31*31^{(1/2)}*11^{(1/2)} \\ & *((7+5*x)/(4*x+1))^{(1/2)}, 1/39*31^{(1/2)}*78^{(1/2)})-42803588152619*11^{(1/2)}*((\\ & 7+5*x)/(4*x+1))^{(1/2)}*3^{(1/2)}*13^{(1/2)}*((2*x-5)/(4*x+1))^{(1/2)}*((-2+3*x)/(4 \\ & *x+1))^{(1/2)}*\text{EllipticPi}(1/31*31^{(1/2)}*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}, 124/ \\ & 55, 1/39*31^{(1/2)}*78^{(1/2)})-56006992911870*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}* \\ & 3^{(1/2)}*13^{(1/2)}*((2*x-5)/(4*x+1))^{(1/2)}*((-2+3*x)/(4*x+1))^{(1/2)}*\text{EllipticE} \end{aligned}$

$(1/31*31^{(1/2)}*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}, 1/39*31^{(1/2)}*78^{(1/2)})+170$
 $79828480000*x^7+306369423360000*x^6-1238644382976000*x^5-3644179735996800*$
 $x^4-3411264539482800*x^3+18436555308411240*x^2+15642366908265240*x-16765465$
 $556439600)/(120*x^4-182*x^3-385*x^2+197*x+70)$

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (5x + 7)^{\frac{5}{2}} \sqrt{4x + 1} \sqrt{2x - 5} \sqrt{-3x + 2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((7+5*x)^(5/2)*(2-3*x)^(1/2)*(-5+2*x)^(1/2)*(1+4*x)^(1/2),x, algorithm="maxima")

[Out] integrate((5*x + 7)^(5/2)*sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2), x)

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\left(25x^2 + 70x + 49\right)\sqrt{5x + 7}\sqrt{4x + 1}\sqrt{2x - 5}\sqrt{-3x + 2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((7+5*x)^(5/2)*(2-3*x)^(1/2)*(-5+2*x)^(1/2)*(1+4*x)^(1/2),x, algorithm="fricas")

[Out] integral((25*x^2 + 70*x + 49)*sqrt(5*x + 7)*sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2), x)

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((7+5*x)**(5/2)*(2-3*x)**(1/2)*(-5+2*x)**(1/2)*(1+4*x)**(1/2),x)

[Out] Timed out

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (5x + 7)^{\frac{5}{2}} \sqrt{4x + 1} \sqrt{2x - 5} \sqrt{-3x + 2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((7+5*x)^(5/2)*(2-3*x)^(1/2)*(-5+2*x)^(1/2)*(1+4*x)^(1/2),x, algorithm="giac")

[Out] integrate((5*x + 7)^(5/2)*sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2), x)

$$3.78 \quad \int \sqrt{2-3x} \sqrt{-5+2x} \sqrt{1+4x} (7+5x)^{3/2} dx$$

Optimal. Leaf size=429

$$\frac{982275517 \sqrt{\frac{11}{23}} \sqrt{5x+7} \text{EllipticF}\left(\tan^{-1}\left(\frac{\sqrt{4x+1}}{\sqrt{2\sqrt{2-3x}}}\right), -\frac{39}{23}\right)}{4147200 \sqrt{2x-5} \sqrt{\frac{5x+7}{5-2x}}} + \frac{1}{20} \sqrt{2-3x} \sqrt{2x-5} \sqrt{4x+1} (5x+7)^{5/2} - \frac{427 \sqrt{2-3x} \sqrt{2x-5} \sqrt{4x+1} \sqrt{5x+7}}{69120}$$

```
[Out] (-1471781*Sqrt[2 - 3*x]*Sqrt[1 + 4*x]*Sqrt[7 + 5*x])/(51200*Sqrt[-5 + 2*x])
- (267029*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*Sqrt[7 + 5*x])/69120
- (427*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(7 + 5*x)^(3/2))/1440 + (
Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(7 + 5*x)^(5/2))/20 + (1471781*S
qrt[429]*Sqrt[2 - 3*x]*Sqrt[(7 + 5*x)/(5 - 2*x)]*EllipticE[ArcSin[(Sqrt[39/
23]*Sqrt[1 + 4*x])/Sqrt[-5 + 2*x]], -23/39])/(102400*Sqrt[(2 - 3*x)/(5 - 2*
x)]*Sqrt[7 + 5*x]) - (982275517*Sqrt[11/23]*Sqrt[7 + 5*x]*EllipticF[ArcTan[
Sqrt[1 + 4*x]/(Sqrt[2]*Sqrt[2 - 3*x])], -39/23])/(4147200*Sqrt[-5 + 2*x]*S
qrt[(7 + 5*x)/(5 - 2*x)]) - (145131624827*(2 - 3*x)*Sqrt[(5 - 2*x)/(2 - 3*x)
]*Sqrt[-((1 + 4*x)/(2 - 3*x))]*EllipticPi[-69/55, ArcSin[(Sqrt[11/23]*Sqrt[
7 + 5*x])/Sqrt[2 - 3*x]], -23/39])/(20736000*Sqrt[429]*Sqrt[-5 + 2*x]*Sqrt[
1 + 4*x])
```

Rubi [A] time = 0.541804, antiderivative size = 429, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 10, integrand size = 37, $\frac{\text{number of rules}}{\text{integrand size}} = 0.27$, Rules used = {161, 1600, 1602, 1598, 170, 418, 165, 537, 176, 424}

$$\frac{1}{20} \sqrt{2-3x} \sqrt{2x-5} \sqrt{4x+1} (5x+7)^{5/2} - \frac{427 \sqrt{2-3x} \sqrt{2x-5} \sqrt{4x+1} (5x+7)^{3/2}}{1440} - \frac{267029 \sqrt{2-3x} \sqrt{2x-5} \sqrt{4x+1} \sqrt{5x+7}}{69120}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(7 + 5*x)^(3/2), x]
```

```
[Out] (-1471781*Sqrt[2 - 3*x]*Sqrt[1 + 4*x]*Sqrt[7 + 5*x])/(51200*Sqrt[-5 + 2*x])
- (267029*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*Sqrt[7 + 5*x])/69120
- (427*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(7 + 5*x)^(3/2))/1440 + (
Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(7 + 5*x)^(5/2))/20 + (1471781*S
qrt[429]*Sqrt[2 - 3*x]*Sqrt[(7 + 5*x)/(5 - 2*x)]*EllipticE[ArcSin[(Sqrt[39/
23]*Sqrt[1 + 4*x])/Sqrt[-5 + 2*x]], -23/39])/(102400*Sqrt[(2 - 3*x)/(5 - 2*
```

```
x])*Sqrt[7 + 5*x]) - (982275517*Sqrt[11/23]*Sqrt[7 + 5*x]*EllipticF[ArcTan[
Sqrt[1 + 4*x]/(Sqrt[2]*Sqrt[2 - 3*x])], -39/23])/(4147200*Sqrt[-5 + 2*x]*Sq
rt[(7 + 5*x)/(5 - 2*x)]) - (145131624827*(2 - 3*x)*Sqrt[(5 - 2*x)/(2 - 3*x)
])*Sqrt[-((1 + 4*x)/(2 - 3*x))]*EllipticPi[-69/55, ArcSin[(Sqrt[11/23]*Sqrt[
7 + 5*x])/Sqrt[2 - 3*x]], -23/39])/(20736000*Sqrt[429]*Sqrt[-5 + 2*x]*Sqrt[
1 + 4*x])
```

Rule 161

```
Int[((a_.) + (b_.)*(x_))^(m_)*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(
x_)]*Sqrt[(g_.) + (h_.)*(x_)], x_Symbol] := Simp[(2*(a + b*x)^(m + 1)*Sqrt[
c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(b*(2*m + 5)), x] + Dist[1/(b*(2*m +
5)), Int[((a + b*x)^m*Simp[3*b*c*e*g - a*(d*e*g + c*f*g + c*e*h) + 2*(b*(d*
e*g + c*f*g + c*e*h) - a*(d*f*g + d*e*h + c*f*h))*x - (3*a*d*f*h - b*(d*f*g
+ d*e*h + c*f*h))*x^2, x])/(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]), x]
, x] /; FreeQ[{a, b, c, d, e, f, g, h, m}, x] && IntegerQ[2*m] && !LtQ[m,
-1]
```

Rule 1600

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((A_.) + (B_.)*(x_) + (C_.)*(x_)^2)/(Sqrt[
(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_S
ymbol] := Simp[(2*C*(a + b*x)^m*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/
(d*f*h*(2*m + 3)), x] + Dist[1/(d*f*h*(2*m + 3)), Int[((a + b*x)^(m - 1)/(S
qrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]))*Simp[a*A*d*f*h*(2*m + 3) - C*(a*
(d*e*g + c*f*g + c*e*h) + 2*b*c*e*g*m) + ((A*b + a*B)*d*f*h*(2*m + 3) - C*(
2*a*(d*f*g + d*e*h + c*f*h) + b*(2*m + 1)*(d*e*g + c*f*g + c*e*h)))*x + (b*
B*d*f*h*(2*m + 3) + 2*C*(a*d*f*h*m - b*(m + 1)*(d*f*g + d*e*h + c*f*h)))*x^
2, x], x] /; FreeQ[{a, b, c, d, e, f, g, h, A, B, C}, x] && IntegerQ[2*
m] && GtQ[m, 0]
```

Rule 1602

```
Int[((A_.) + (B_.)*(x_) + (C_.)*(x_)^2)/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.
) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbo
l] := Simp[(C*Sqrt[a + b*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(b*f*h*Sqrt[c + d*
x]), x] + (Dist[1/(2*b*d*f*h), Int[(1*Simp[2*A*b*d*f*h - C*(b*d*e*g + a*c*f
*h) + (2*b*B*d*f*h - C*(a*d*f*h + b*(d*f*g + d*e*h + c*f*h)))*x, x])/(Sqrt[
a + b*x]*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]), x], x] + Dist[(C*(d*e
- c*f)*(d*g - c*h))/(2*b*d*f*h), Int[Sqrt[a + b*x]/((c + d*x)^(3/2)*Sqrt[e
+ f*x]*Sqrt[g + h*x]), x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, A, B, C},
x]
```

Rule 1598

```
Int[((A_.) + (B_.)*(x_))/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]
*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Dist[(A*b
- a*B)/b, Int[1/(Sqrt[a + b*x]*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]),
x], x] + Dist[B/b, Int[Sqrt[a + b*x]/(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g +
h*x]), x], x] /; FreeQ[{a, b, c, d, e, f, g, h, A, B}, x]
```

Rule 170

```
Int[1/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)
*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Dist[(2*Sqrt[g + h*x]*Sqrt[(
(b*e - a*f)*(c + d*x))/((d*e - c*f)*(a + b*x))])/((f*g - e*h)*Sqrt[c + d*x]
*Sqrt[-(((b*e - a*f)*(g + h*x))/((f*g - e*h)*(a + b*x))))], Subst[Int[1/(Sq
rt[1 + ((b*c - a*d)*x^2)/(d*e - c*f)]*Sqrt[1 - ((b*g - a*h)*x^2)/(f*g - e*h
]]), x], x, Sqrt[e + f*x]/Sqrt[a + b*x]], x] /; FreeQ[{a, b, c, d, e, f, g,
h}, x]
```

Rule 418

```
Int[1/(Sqrt[(a_) + (b_.)*(x_)^2]*Sqrt[(c_) + (d_.)*(x_)^2]), x_Symbol] := S
imp[(Sqrt[a + b*x^2]*EllipticF[ArcTan[Rt[d/c, 2]*x], 1 - (b*c)/(a*d)]/(a*R
t[d/c, 2]*Sqrt[c + d*x^2]*Sqrt[(c*(a + b*x^2))/(a*(c + d*x^2))]), x] /; Fre
eQ[{a, b, c, d}, x] && PosQ[d/c] && PosQ[b/a] && !SimplerSqrtQ[b/a, d/c]
```

Rule 165

```
Int[Sqrt[(a_.) + (b_.)*(x_)]/(Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(
x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Dist[(2*(a + b*x)*Sqrt[((b*g -
a*h)*(c + d*x))/((d*g - c*h)*(a + b*x))]*Sqrt[((b*g - a*h)*(e + f*x))/((f*
g - e*h)*(a + b*x))])/((Sqrt[c + d*x]*Sqrt[e + f*x]), Subst[Int[1/((h - b*x^
2)*Sqrt[1 + ((b*c - a*d)*x^2)/(d*g - c*h)]*Sqrt[1 + ((b*e - a*f)*x^2)/(f*g
- e*h)]), x], x, Sqrt[g + h*x]/Sqrt[a + b*x]], x] /; FreeQ[{a, b, c, d, e,
f, g, h}, x]
```

Rule 537

```
Int[1/(((a_) + (b_.)*(x_)^2)*Sqrt[(c_) + (d_.)*(x_)^2]*Sqrt[(e_) + (f_.)*(x
_)^2]), x_Symbol] := Simp[(1*EllipticPi[(b*c)/(a*d), ArcSin[Rt[-(d/c), 2]*x
], (c*f)/(d*e)]/(a*Sqrt[c]*Sqrt[e]*Rt[-(d/c), 2]), x] /; FreeQ[{a, b, c, d
, e, f}, x] && !GtQ[d/c, 0] && GtQ[c, 0] && GtQ[e, 0] && !( !GtQ[f/e, 0]
&& SimplerSqrtQ[-(f/e), -(d/c)])
```

Rule 176

```
Int[Sqrt[(c_.) + (d_.)*(x_)]/(((a_.) + (b_.)*(x_))^(3/2)*Sqrt[(e_.) + (f_.)
*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Dist[(-2*Sqrt[c + d*x]*Sqrt[
```


$$-\left(\frac{(b*e - a*f)*(g + h*x)}{(f*g - e*h)*(a + b*x)}\right) / \left(\frac{(b*e - a*f)*\sqrt{g + h*x}}{(f*g - e*h)*(a + b*x)}\right) \cdot \text{Subst}\left[\int \sqrt{\frac{1 + ((b*c - a*d)*x^2)/(d*e - c*f)}{1 - ((b*g - a*h)*x^2)/(f*g - e*h)}} dx, x, \sqrt{\frac{e + f*x}{a + b*x}}\right] /;$$

$$\text{FreeQ}\{a, b, c, d, e, f, g, h, x\}$$

Rule 424

$$\text{Int}\left[\sqrt{(a_.) + (b_.)*(x_)^2} / \sqrt{(c_) + (d_.)*(x_)^2}, x_Symbol\right] \rightarrow \text{Simp}\left[\left(\sqrt{a} * \text{EllipticE}\left[\text{ArcSin}\left[\text{Rt}\left[-(d/c), 2\right]*x\right], (b*c)/(a*d)\right)\right) / \left(\sqrt{c} * \text{Rt}\left[-(d/c), 2\right]\right), x\right] /;$$

$$\text{FreeQ}\{a, b, c, d\}, x \ \&\& \ \text{NegQ}[d/c] \ \&\& \ \text{GtQ}[c, 0] \ \&\& \ \text{GtQ}[a, 0]$$

Rubi steps

$$\begin{aligned} \int \sqrt{2 - 3x}\sqrt{-5 + 2x}\sqrt{1 + 4x}(7 + 5x)^{3/2} dx &= \frac{1}{20} \sqrt{2 - 3x}\sqrt{-5 + 2x}\sqrt{1 + 4x}(7 + 5x)^{5/2} + \frac{1}{40} \int \frac{(7 + 5x)^{3/2} (-3 - 1190x)}{\sqrt{2 - 3x}\sqrt{-5 + 2x}\sqrt{1 + 4x}} dx \\ &= -\frac{427\sqrt{2 - 3x}\sqrt{-5 + 2x}\sqrt{1 + 4x}(7 + 5x)^{3/2}}{1440} + \frac{1}{20} \sqrt{2 - 3x}\sqrt{-5 + 2x}\sqrt{1 + 4x}(7 + 5x)^{5/2} \\ &= -\frac{267029\sqrt{2 - 3x}\sqrt{-5 + 2x}\sqrt{1 + 4x}\sqrt{7 + 5x}}{69120} - \frac{427\sqrt{2 - 3x}\sqrt{-5 + 2x}\sqrt{1 + 4x}(7 + 5x)^{3/2}}{1440} \\ &= -\frac{1471781\sqrt{2 - 3x}\sqrt{1 + 4x}\sqrt{7 + 5x}}{51200\sqrt{-5 + 2x}} - \frac{267029\sqrt{2 - 3x}\sqrt{-5 + 2x}\sqrt{1 + 4x}\sqrt{7 + 5x}}{69120} \\ &= -\frac{1471781\sqrt{2 - 3x}\sqrt{1 + 4x}\sqrt{7 + 5x}}{51200\sqrt{-5 + 2x}} - \frac{267029\sqrt{2 - 3x}\sqrt{-5 + 2x}\sqrt{1 + 4x}\sqrt{7 + 5x}}{69120} \\ &= -\frac{1471781\sqrt{2 - 3x}\sqrt{1 + 4x}\sqrt{7 + 5x}}{51200\sqrt{-5 + 2x}} - \frac{267029\sqrt{2 - 3x}\sqrt{-5 + 2x}\sqrt{1 + 4x}\sqrt{7 + 5x}}{69120} \\ &= -\frac{1471781\sqrt{2 - 3x}\sqrt{1 + 4x}\sqrt{7 + 5x}}{51200\sqrt{-5 + 2x}} - \frac{267029\sqrt{2 - 3x}\sqrt{-5 + 2x}\sqrt{1 + 4x}\sqrt{7 + 5x}}{69120} \end{aligned}$$

Mathematica [A] time = 4.15613, size = 345, normalized size = 0.8

$$\sqrt{2x-5}\sqrt{4x+1}\left(-5426733148\sqrt{682}\sqrt{\frac{8x^2-18x-5}{(2-3x)^2}}(15x^2+11x-14)\operatorname{EllipticF}\left(\sin^{-1}\left(\sqrt{\frac{31}{39}}\sqrt{\frac{2x-5}{3x-2}}\right),\frac{39}{62}\right)+7391284182\sqrt{\frac{31}{39}}\sqrt{\frac{2x-5}{3x-2}}\right)$$

Warning: Unable to verify antiderivative.

[In] Integrate[Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(7 + 5*x)^(3/2), x]

[Out] -(Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(7391284182*Sqrt[682]*Sqrt[(-5 - 18*x + 8*x^2)/(2 - 3*x)^2]*(-14 + 11*x + 15*x^2)*EllipticE[ArcSin[Sqrt[31/39]*Sqrt[(-5 + 2*x)/(-2 + 3*x)]], 39/62] - 5426733148*Sqrt[682]*Sqrt[(-5 - 18*x + 8*x^2)/(2 - 3*x)^2]*(-14 + 11*x + 15*x^2)*EllipticF[ArcSin[Sqrt[31/39]*Sqrt[(-5 + 2*x)/(-2 + 3*x)]], 39/62] + Sqrt[(7 + 5*x)/(-2 + 3*x)]*(186*(3497259535 + 16491468251*x + 9107809874*x^2 - 4479491480*x^3 - 3503236800*x^4 + 40320000*x^5 + 414720000*x^6) - 4681665317*Sqrt[682]*(2 - 3*x)^2*Sqrt[(1 + 4*x)/(-2 + 3*x)]*Sqrt[(-35 - 11*x + 10*x^2)/(2 - 3*x)^2]*EllipticPi[117/62, ArcSin[Sqrt[31/39]*Sqrt[(-5 + 2*x)/(-2 + 3*x)]], 39/62]))/(514252800*Sqrt[2 - 3*x]*Sqrt[7 + 5*x]*Sqrt[(7 + 5*x)/(-2 + 3*x)]*(-5 - 18*x + 8*x^2))

Maple [B] time = 0.018, size = 890, normalized size = 2.1

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] int((7+5*x)^(3/2)*(2-3*x)^(1/2)*(2*x-5)^(1/2)*(4*x+1)^(1/2), x)

[Out] 1/11860992000*(7+5*x)^(1/2)*(2-3*x)^(1/2)*(2*x-5)^(1/2)*(4*x+1)^(1/2)*(201797192080*11^(1/2)*((7+5*x)/(4*x+1))^(1/2)*3^(1/2)*13^(1/2)*((2*x-5)/(4*x+1))^(1/2)*((-2+3*x)/(4*x+1))^(1/2)*x^2*EllipticF(1/31*31^(1/2)*11^(1/2)*((7+5*x)/(4*x+1))^(1/2), 1/39*31^(1/2)*78^(1/2))-1722852836656*11^(1/2)*((7+5*x)/(4*x+1))^(1/2)*3^(1/2)*13^(1/2)*((2*x-5)/(4*x+1))^(1/2)*((-2+3*x)/(4*x+1))^(1/2)*x^2*EllipticPi(1/31*31^(1/2)*11^(1/2)*((7+5*x)/(4*x+1))^(1/2), 124/55, 1/39*31^(1/2)*78^(1/2))-2727622291680*11^(1/2)*((7+5*x)/(4*x+1))^(1/2)*3^(1/2)*13^(1/2)*((2*x-5)/(4*x+1))^(1/2)*((-2+3*x)/(4*x+1))^(1/2)*x^2*EllipticE(1/31*31^(1/2)*11^(1/2)*((7+5*x)/(4*x+1))^(1/2), 1/39*31^(1/2)*78^(1/2))+100898596040*11^(1/2)*((7+5*x)/(4*x+1))^(1/2)*3^(1/2)*13^(1/2)*((2*x-5)/(4*x+1))^(1/2)*((-2+3*x)/(4*x+1))^(1/2)*x*EllipticF(1/31*31^(1/2)*11^(1/2)*((7+5*x)/(4*x+1))^(1/2), 1/39*31^(1/2)*78^(1/2))-861426418328*11^(1/2)*((7+5*x)/(4

```

*x+1))^(1/2)*3^(1/2)*13^(1/2)*((2*x-5)/(4*x+1))^(1/2)*((-2+3*x)/(4*x+1))^(1
/2)*x*EllipticPi(1/31*31^(1/2)*11^(1/2)*((7+5*x)/(4*x+1))^(1/2),124/55,1/39
*31^(1/2)*78^(1/2))-1363811145840*11^(1/2)*((7+5*x)/(4*x+1))^(1/2)*3^(1/2)*
13^(1/2)*((2*x-5)/(4*x+1))^(1/2)*((-2+3*x)/(4*x+1))^(1/2)*x*EllipticE(1/31*
31^(1/2)*11^(1/2)*((7+5*x)/(4*x+1))^(1/2),1/39*31^(1/2)*78^(1/2))+126123245
05*11^(1/2)*((7+5*x)/(4*x+1))^(1/2)*3^(1/2)*13^(1/2)*((2*x-5)/(4*x+1))^(1/2
)*((-2+3*x)/(4*x+1))^(1/2)*EllipticF(1/31*31^(1/2)*11^(1/2)*((7+5*x)/(4*x+1
))^(1/2),1/39*31^(1/2)*78^(1/2))-107678302291*11^(1/2)*((7+5*x)/(4*x+1))^(1
/2)*3^(1/2)*13^(1/2)*((2*x-5)/(4*x+1))^(1/2)*((-2+3*x)/(4*x+1))^(1/2)*Ellip
ticPi(1/31*31^(1/2)*11^(1/2)*((7+5*x)/(4*x+1))^(1/2),124/55,1/39*31^(1/2)*7
8^(1/2))-170476393230*11^(1/2)*((7+5*x)/(4*x+1))^(1/2)*3^(1/2)*13^(1/2)*((2
*x-5)/(4*x+1))^(1/2)*((-2+3*x)/(4*x+1))^(1/2)*EllipticE(1/31*31^(1/2)*11^(1
/2)*((7+5*x)/(4*x+1))^(1/2),1/39*31^(1/2)*78^(1/2))+1779148800000*x^6+17297
2800000*x^5-15028885872000*x^4-19217018449200*x^3+57824907614760*x^2+501207
55215960*x-50630167988400)/(120*x^4-182*x^3-385*x^2+197*x+70)

```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (5x + 7)^{\frac{3}{2}} \sqrt{4x + 1} \sqrt{2x - 5} \sqrt{-3x + 2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((7+5*x)^(3/2)*(2-3*x)^(1/2)*(-5+2*x)^(1/2)*(1+4*x)^(1/2),x, algor
ithm="maxima")
```

```
[Out] integrate((5*x + 7)^(3/2)*sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left((5x + 7)^{\frac{3}{2}} \sqrt{4x + 1} \sqrt{2x - 5} \sqrt{-3x + 2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((7+5*x)^(3/2)*(2-3*x)^(1/2)*(-5+2*x)^(1/2)*(1+4*x)^(1/2),x, algor
ithm="fricas")
```

```
[Out] integral((5*x + 7)^(3/2)*sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((7+5*x)**(3/2)*(2-3*x)**(1/2)*(-5+2*x)**(1/2)*(1+4*x)**(1/2), x)

[Out] Timed out

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (5x + 7)^{\frac{3}{2}} \sqrt{4x + 1} \sqrt{2x - 5} \sqrt{-3x + 2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((7+5*x)^(3/2)*(2-3*x)^(1/2)*(-5+2*x)^(1/2)*(1+4*x)^(1/2), x, algorithm="giac")

[Out] integrate((5*x + 7)^(3/2)*sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2), x)

3.79 $\int \sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}\sqrt{7+5x} dx$

Optimal. Leaf size=391

$$\frac{1368371\sqrt{\frac{11}{23}}\sqrt{5x+7}\text{EllipticF}\left(\tan^{-1}\left(\frac{\sqrt{4x+1}}{\sqrt{2}\sqrt{2-3x}}\right), -\frac{39}{23}\right)}{43200\sqrt{2x-5}\sqrt{\frac{5x+7}{5-2x}}} - \frac{1}{9}\sqrt{2x-5}\sqrt{4x+1}\sqrt{5x+7}(2-3x)^{3/2} + \frac{23}{240}\sqrt{2x-5}\sqrt{4x+1}$$

```
[Out] (-13027*Sqrt[2 - 3*x]*Sqrt[1 + 4*x]*Sqrt[7 + 5*x])/(4800*Sqrt[-5 + 2*x]) +
(23*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*Sqrt[7 + 5*x])/240 - ((2 - 3
*x)^(3/2)*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*Sqrt[7 + 5*x])/9 + (13027*Sqrt[143/3
]*Sqrt[2 - 3*x]*Sqrt[(7 + 5*x)/(5 - 2*x)]*EllipticE[ArcSin[(Sqrt[39/23]*Sqr
t[1 + 4*x])/Sqrt[-5 + 2*x]], -23/39])/(3200*Sqrt[(2 - 3*x)/(5 - 2*x)]*Sqrt[
7 + 5*x]) - (1368371*Sqrt[11/23]*Sqrt[7 + 5*x]*EllipticF[ArcTan[Sqrt[1 + 4*
x]/(Sqrt[2]*Sqrt[2 - 3*x])], -39/23])/(43200*Sqrt[-5 + 2*x]*Sqrt[(7 + 5*x)/
(5 - 2*x)]) - (65750101*(2 - 3*x)*Sqrt[(5 - 2*x)/(2 - 3*x)]*Sqrt[-((1 + 4*x
)/(2 - 3*x))]*EllipticPi[-69/55, ArcSin[(Sqrt[11/23]*Sqrt[7 + 5*x])/Sqrt[2
- 3*x]], -23/39])/(216000*Sqrt[429]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])
```

Rubi [A] time = 0.428624, antiderivative size = 391, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 10, integrand size = 37, $\frac{\text{number of rules}}{\text{integrand size}} = 0.27$, Rules used = {161, 1600, 1602, 1598, 170, 418, 165, 537, 176, 424}

$$-\frac{1}{9}\sqrt{2x-5}\sqrt{4x+1}\sqrt{5x+7}(2-3x)^{3/2} + \frac{23}{240}\sqrt{2x-5}\sqrt{4x+1}\sqrt{5x+7}\sqrt{2-3x} - \frac{13027\sqrt{4x+1}\sqrt{5x+7}\sqrt{2-3x}}{4800\sqrt{2x-5}} - \frac{1368371\sqrt{\frac{11}{23}}\sqrt{5x+7}\text{EllipticF}\left(\tan^{-1}\left(\frac{\sqrt{4x+1}}{\sqrt{2}\sqrt{2-3x}}\right), -\frac{39}{23}\right)}{43200\sqrt{2x-5}\sqrt{\frac{5x+7}{5-2x}}}$$

Antiderivative was successfully verified.

[In] Int[Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*Sqrt[7 + 5*x], x]

```
[Out] (-13027*Sqrt[2 - 3*x]*Sqrt[1 + 4*x]*Sqrt[7 + 5*x])/(4800*Sqrt[-5 + 2*x]) +
(23*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*Sqrt[7 + 5*x])/240 - ((2 - 3
*x)^(3/2)*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*Sqrt[7 + 5*x])/9 + (13027*Sqrt[143/3
]*Sqrt[2 - 3*x]*Sqrt[(7 + 5*x)/(5 - 2*x)]*EllipticE[ArcSin[(Sqrt[39/23]*Sqr
t[1 + 4*x])/Sqrt[-5 + 2*x]], -23/39])/(3200*Sqrt[(2 - 3*x)/(5 - 2*x)]*Sqrt[
7 + 5*x]) - (1368371*Sqrt[11/23]*Sqrt[7 + 5*x]*EllipticF[ArcTan[Sqrt[1 + 4*
x]/(Sqrt[2]*Sqrt[2 - 3*x])], -39/23])/(43200*Sqrt[-5 + 2*x]*Sqrt[(7 + 5*x)/
(5 - 2*x)]) - (65750101*(2 - 3*x)*Sqrt[(5 - 2*x)/(2 - 3*x)]*Sqrt[-((1 + 4*x
```

)/(2 - 3*x))*EllipticPi[-69/55, ArcSin[(Sqrt[11/23]*Sqrt[7 + 5*x])/Sqrt[2 - 3*x]], -23/39]]/(216000*Sqrt[429]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])

Rule 161

```
Int[((a_.) + (b_.)*(x_))^(m_)*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)], x_Symbol] := Simp[(2*(a + b*x)^(m + 1)*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(b*(2*m + 5)), x] + Dist[1/(b*(2*m + 5)), Int[((a + b*x)^m*Simp[3*b*c*e*g - a*(d*e*g + c*f*g + c*e*h) + 2*(b*(d*e*g + c*f*g + c*e*h) - a*(d*f*g + d*e*h + c*f*h))*x - (3*a*d*f*h - b*(d*f*g + d*e*h + c*f*h))*x^2, x])/(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]), x] /; FreeQ[{a, b, c, d, e, f, g, h, m}, x] && IntegerQ[2*m] && !LtQ[m, -1]
```

Rule 1600

```
Int[(((a_.) + (b_.)*(x_))^(m_.)*((A_.) + (B_.)*(x_) + (C_.)*(x_)^2))/(Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Simp[(2*C*(a + b*x)^m*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(d*f*h*(2*m + 3)), x] + Dist[1/(d*f*h*(2*m + 3)), Int[(((a + b*x)^(m - 1)/(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]))*Simp[a*A*d*f*h*(2*m + 3) - C*(a*(d*e*g + c*f*g + c*e*h) + 2*b*c*e*g*m) + ((A*b + a*B)*d*f*h*(2*m + 3) - C*(2*a*(d*f*g + d*e*h + c*f*h) + b*(2*m + 1)*(d*e*g + c*f*g + c*e*h)))*x + (b*B*d*f*h*(2*m + 3) + 2*C*(a*d*f*h*m - b*(m + 1)*(d*f*g + d*e*h + c*f*h)))*x^2, x], x] /; FreeQ[{a, b, c, d, e, f, g, h, A, B, C}, x] && IntegerQ[2*m] && GtQ[m, 0]
```

Rule 1602

```
Int[((A_.) + (B_.)*(x_) + (C_.)*(x_)^2)/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Simp[(C*Sqrt[a + b*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(b*f*h*Sqrt[c + d*x]), x] + (Dist[1/(2*b*d*f*h), Int[(1*Simp[2*A*b*d*f*h - C*(b*d*e*g + a*c*f*h) + (2*b*B*d*f*h - C*(a*d*f*h + b*(d*f*g + d*e*h + c*f*h)))*x, x])/(Sqrt[a + b*x]*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]), x], x] + Dist[(C*(d*e - c*f)*(d*g - c*h))/(2*b*d*f*h), Int[Sqrt[a + b*x]/((c + d*x)^(3/2)*Sqrt[e + f*x]*Sqrt[g + h*x]), x], x] /; FreeQ[{a, b, c, d, e, f, g, h, A, B, C}, x]
```

Rule 1598

```
Int[((A_.) + (B_.)*(x_))/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Dist[(A*b - a*B)/b, Int[1/(Sqrt[a + b*x]*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]), x], x] + Dist[B/b, Int[Sqrt[a + b*x]/(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]), x], x]
```

$h*x]), x], x] /; \text{FreeQ}\{a, b, c, d, e, f, g, h, A, B\}, x]$

Rule 170

$\text{Int}[1/(\text{Sqrt}[(a_.) + (b_.)*(x_.)]*\text{Sqrt}[(c_.) + (d_.)*(x_.)]*\text{Sqrt}[(e_.) + (f_.)*(x_.)]*\text{Sqrt}[(g_.) + (h_.)*(x_.)]), x_Symbol] \rightarrow \text{Dist}[(2*\text{Sqrt}[g + h*x]*\text{Sqrt}[(b*e - a*f)*(c + d*x)]/((d*e - c*f)*(a + b*x)))]/((f*g - e*h)*\text{Sqrt}[c + d*x]*\text{Sqrt}[-(((b*e - a*f)*(g + h*x))/((f*g - e*h)*(a + b*x)))]), \text{Subst}[\text{Int}[1/(\text{Sqrt}[1 + ((b*c - a*d)*x^2)/(d*e - c*f)]*\text{Sqrt}[1 - ((b*g - a*h)*x^2)/(f*g - e*h]])], x], x, \text{Sqrt}[e + f*x]/\text{Sqrt}[a + b*x]], x] /; \text{FreeQ}\{a, b, c, d, e, f, g, h\}, x]$

Rule 418

$\text{Int}[1/(\text{Sqrt}[(a_.) + (b_.)*(x_.)^2]*\text{Sqrt}[(c_.) + (d_.)*(x_.)^2]), x_Symbol] \rightarrow \text{Simp}[(\text{Sqrt}[a + b*x^2]*\text{EllipticF}[\text{ArcTan}[\text{Rt}[d/c, 2]*x], 1 - (b*c)/(a*d)])/(a*\text{Rt}[d/c, 2]*\text{Sqrt}[c + d*x^2]*\text{Sqrt}[(c*(a + b*x^2))/(a*(c + d*x^2))]), x] /; \text{FreeQ}\{a, b, c, d\}, x] \&\& \text{PosQ}[d/c] \&\& \text{PosQ}[b/a] \&\& \text{!SimplerSqrtQ}[b/a, d/c]$

Rule 165

$\text{Int}[\text{Sqrt}[(a_.) + (b_.)*(x_.)]/(\text{Sqrt}[(c_.) + (d_.)*(x_.)]*\text{Sqrt}[(e_.) + (f_.)*(x_.)]*\text{Sqrt}[(g_.) + (h_.)*(x_.)]), x_Symbol] \rightarrow \text{Dist}[(2*(a + b*x)*\text{Sqrt}[(b*g - a*h)*(c + d*x)]/((d*g - c*h)*(a + b*x))]*\text{Sqrt}[(b*g - a*h)*(e + f*x)]/((f*g - e*h)*(a + b*x))]/(\text{Sqrt}[c + d*x]*\text{Sqrt}[e + f*x]), \text{Subst}[\text{Int}[1/((h - b*x^2)*\text{Sqrt}[1 + ((b*c - a*d)*x^2)/(d*g - c*h)]*\text{Sqrt}[1 + ((b*e - a*f)*x^2)/(f*g - e*h]])], x], x, \text{Sqrt}[g + h*x]/\text{Sqrt}[a + b*x]], x] /; \text{FreeQ}\{a, b, c, d, e, f, g, h\}, x]$

Rule 537

$\text{Int}[1/(((a_.) + (b_.)*(x_.)^2)*\text{Sqrt}[(c_.) + (d_.)*(x_.)^2]*\text{Sqrt}[(e_.) + (f_.)*(x_.)^2]), x_Symbol] \rightarrow \text{Simp}[(1*\text{EllipticPi}[(b*c)/(a*d), \text{ArcSin}[\text{Rt}[-(d/c), 2]*x], (c*f)/(d*e))]/(a*\text{Sqrt}[c]*\text{Sqrt}[e]*\text{Rt}[-(d/c), 2]), x] /; \text{FreeQ}\{a, b, c, d, e, f\}, x] \&\& \text{!GtQ}[d/c, 0] \&\& \text{GtQ}[c, 0] \&\& \text{GtQ}[e, 0] \&\& \text{!(!GtQ}[f/e, 0] \&\& \text{SimplerSqrtQ}[-(f/e), -(d/c)])]$

Rule 176

$\text{Int}[\text{Sqrt}[(c_.) + (d_.)*(x_.)]/(((a_.) + (b_.)*(x_.))^(3/2)*\text{Sqrt}[(e_.) + (f_.)*(x_.)]*\text{Sqrt}[(g_.) + (h_.)*(x_.)]), x_Symbol] \rightarrow \text{Dist}[(-2*\text{Sqrt}[c + d*x]*\text{Sqrt}[-(((b*e - a*f)*(g + h*x))/((f*g - e*h)*(a + b*x)))]/((b*e - a*f)*\text{Sqrt}[g + h*x]*\text{Sqrt}[(b*e - a*f)*(c + d*x)]/((d*e - c*f)*(a + b*x)))]), \text{Subst}[\text{Int}[\text{Sqrt}[1 + ((b*c - a*d)*x^2)/(d*e - c*f)]/\text{Sqrt}[1 - ((b*g - a*h)*x^2)/(f*g - e*h)]], x], x, \text{Sqrt}[e + f*x]/\text{Sqrt}[a + b*x]], x] /; \text{FreeQ}\{a, b, c, d, e, f, g, h\}$

, x]

Rule 424

```
Int[Sqrt[(a_) + (b_.)*(x_)^2]/Sqrt[(c_) + (d_.)*(x_)^2], x_Symbol] :> Simp[
(Sqrt[a]*EllipticE[ArcSin[Rt[-(d/c), 2]*x], (b*c)/(a*d)])/(Sqrt[c]*Rt[-(d/c)
), 2]), x] /; FreeQ[{a, b, c, d}, x] && NegQ[d/c] && GtQ[c, 0] && GtQ[a, 0]
```

Rubi steps

$$\begin{aligned}
\int \sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}\sqrt{7+5x} dx &= -\frac{1}{9}(2-3x)^{3/2}\sqrt{-5+2x}\sqrt{1+4x}\sqrt{7+5x} - \frac{1}{18} \int \frac{\sqrt{2-3x}(617+1042x-138x^2)}{\sqrt{-5+2x}\sqrt{1+4x}\sqrt{7+5x}} dx \\
&= \frac{23}{240}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}\sqrt{7+5x} - \frac{1}{9}(2-3x)^{3/2}\sqrt{-5+2x}\sqrt{1+4x}\sqrt{7+5x} \\
&= -\frac{13027\sqrt{2-3x}\sqrt{1+4x}\sqrt{7+5x}}{4800\sqrt{-5+2x}} + \frac{23}{240}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}\sqrt{7+5x} \\
&= -\frac{13027\sqrt{2-3x}\sqrt{1+4x}\sqrt{7+5x}}{4800\sqrt{-5+2x}} + \frac{23}{240}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}\sqrt{7+5x} \\
&= -\frac{13027\sqrt{2-3x}\sqrt{1+4x}\sqrt{7+5x}}{4800\sqrt{-5+2x}} + \frac{23}{240}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}\sqrt{7+5x} \\
&= -\frac{13027\sqrt{2-3x}\sqrt{1+4x}\sqrt{7+5x}}{4800\sqrt{-5+2x}} + \frac{23}{240}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}\sqrt{7+5x}
\end{aligned}$$

Mathematica [A] time = 4.06636, size = 340, normalized size = 0.87

$$\sqrt{2x-5}\sqrt{4x+1} \left(-4532324\sqrt{682}\sqrt{\frac{8x^2-18x-5}{(2-3x)^2}} (15x^2+11x-14) \text{EllipticF} \left(\sin^{-1} \left(\sqrt{\frac{31}{39}} \sqrt{\frac{2x-5}{3x-2}} \right), \frac{39}{62} \right) + 7269066\sqrt{682}\sqrt{\frac{8x^2-18x-5}{(2-3x)^2}} \right)$$

Warning: Unable to verify antiderivative.


```
[In] Integrate[Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*Sqrt[7 + 5*x],x]
```

```
[Out] -(Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(7269066*Sqrt[682]*Sqrt[(-5 - 18*x + 8*x^2)/
(2 - 3*x)^2]*(-14 + 11*x + 15*x^2)*EllipticE[ArcSin[Sqrt[31/39]*Sqrt[(-5 +
2*x)/(-2 + 3*x)]], 39/62] - 4532324*Sqrt[682]*Sqrt[(-5 - 18*x + 8*x^2)/(2 -
3*x)^2]*(-14 + 11*x + 15*x^2)*EllipticF[ArcSin[Sqrt[31/39]*Sqrt[(-5 + 2*x)
/(-2 + 3*x)]], 39/62] + Sqrt[(7 + 5*x)/(-2 + 3*x)]*(186*(3848705 + 17658613
*x + 7278862*x^2 - 7723240*x^3 - 2184000*x^4 + 1152000*x^5) - 2120971*Sqrt[
682]*(2 - 3*x)^2*Sqrt[(1 + 4*x)/(-2 + 3*x)]*Sqrt[(-35 - 11*x + 10*x^2)/(2 -
3*x)^2]*EllipticPi[117/62, ArcSin[Sqrt[31/39]*Sqrt[(-5 + 2*x)/(-2 + 3*x)]]
, 39/62)))/(5356800*Sqrt[2 - 3*x]*Sqrt[7 + 5*x]*Sqrt[(7 + 5*x)/(-2 + 3*x)]
*(-5 - 18*x + 8*x^2))
```

Maple [B] time = 0.02, size = 885, normalized size = 2.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((2-3*x)^(1/2)*(2*x-5)^(1/2)*(4*x+1)^(1/2)*(7+5*x)^(1/2),x)
```

```
[Out] 1/123552000*(2-3*x)^(1/2)*(2*x-5)^(1/2)*(4*x+1)^(1/2)*(7+5*x)^(1/2)*(454813
040*11^(1/2)*((7+5*x)/(4*x+1))^(1/2)*3^(1/2)*13^(1/2)*((2*x-5)/(4*x+1))^(1/
2)*((-2+3*x)/(4*x+1))^(1/2)*x^2*EllipticF(1/31*31^(1/2)*11^(1/2)*((7+5*x)/(
4*x+1))^(1/2),1/39*31^(1/2)*78^(1/2))-780517328*11^(1/2)*((7+5*x)/(4*x+1))^(
1/2)*3^(1/2)*13^(1/2)*((2*x-5)/(4*x+1))^(1/2)*((-2+3*x)/(4*x+1))^(1/2)*x^2
*EllipticPi(1/31*31^(1/2)*11^(1/2)*((7+5*x)/(4*x+1))^(1/2),124/55,1/39*31^(
1/2)*78^(1/2))-2682519840*11^(1/2)*((7+5*x)/(4*x+1))^(1/2)*3^(1/2)*13^(1/2)
*((2*x-5)/(4*x+1))^(1/2)*((-2+3*x)/(4*x+1))^(1/2)*x^2*EllipticE(1/31*31^(1/
2)*11^(1/2)*((7+5*x)/(4*x+1))^(1/2),1/39*31^(1/2)*78^(1/2))+227406520*11^(1
/2)*((7+5*x)/(4*x+1))^(1/2)*3^(1/2)*13^(1/2)*((2*x-5)/(4*x+1))^(1/2)*((-2+3
*x)/(4*x+1))^(1/2)*x*EllipticF(1/31*31^(1/2)*11^(1/2)*((7+5*x)/(4*x+1))^(1/
2),1/39*31^(1/2)*78^(1/2))-390258664*11^(1/2)*((7+5*x)/(4*x+1))^(1/2)*3^(1/
2)*13^(1/2)*((2*x-5)/(4*x+1))^(1/2)*((-2+3*x)/(4*x+1))^(1/2)*x*EllipticPi(1
/31*31^(1/2)*11^(1/2)*((7+5*x)/(4*x+1))^(1/2),124/55,1/39*31^(1/2)*78^(1/2)
)-1341259920*11^(1/2)*((7+5*x)/(4*x+1))^(1/2)*3^(1/2)*13^(1/2)*((2*x-5)/(4*
x+1))^(1/2)*((-2+3*x)/(4*x+1))^(1/2)*x*EllipticE(1/31*31^(1/2)*11^(1/2)*((7
+5*x)/(4*x+1))^(1/2),1/39*31^(1/2)*78^(1/2))+28425815*11^(1/2)*((7+5*x)/(4*
x+1))^(1/2)*3^(1/2)*13^(1/2)*((2*x-5)/(4*x+1))^(1/2)*((-2+3*x)/(4*x+1))^(1/
2)*EllipticF(1/31*31^(1/2)*11^(1/2)*((7+5*x)/(4*x+1))^(1/2),1/39*31^(1/2)*7
8^(1/2))-48782333*11^(1/2)*((7+5*x)/(4*x+1))^(1/2)*3^(1/2)*13^(1/2)*((2*x-5
)/(4*x+1))^(1/2)*((-2+3*x)/(4*x+1))^(1/2)*EllipticPi(1/31*31^(1/2)*11^(1/2)
```

$$\frac{\begin{aligned} & *((7+5*x)/(4*x+1))^{(1/2)}, 124/55, 1/39*31^{(1/2)}*78^{(1/2)} - 167657490*11^{(1/2)} * \\ & ((7+5*x)/(4*x+1))^{(1/2)}*3^{(1/2)}*13^{(1/2)}*((2*x-5)/(4*x+1))^{(1/2)}*((-2+3*x)/ \\ & (4*x+1))^{(1/2)}*EllipticE(1/31*31^{(1/2)}*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}, 1/3 \\ & 9*31^{(1/2)}*78^{(1/2)} + 4942080000*x^5 - 9369360000*x^4 - 33132699600*x^3 + 49668641 \\ & 880*x^2 + 55468893480*x - 48037189200) / (120*x^4 - 182*x^3 - 385*x^2 + 197*x + 70) \end{aligned}}$$

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{5x+7}\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2-3*x)^(1/2)*(-5+2*x)^(1/2)*(1+4*x)^(1/2)*(7+5*x)^(1/2),x, algorithm="maxima")

[Out] integrate(sqrt(5*x + 7)*sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2), x)

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\sqrt{5x+7}\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2-3*x)^(1/2)*(-5+2*x)^(1/2)*(1+4*x)^(1/2)*(7+5*x)^(1/2),x, algorithm="fricas")

[Out] integral(sqrt(5*x + 7)*sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2), x)

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}\sqrt{5x+7} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2-3*x)**(1/2)*(-5+2*x)**(1/2)*(1+4*x)**(1/2)*(7+5*x)**(1/2), x)

[Out] `Integral(sqrt(2 - 3*x)*sqrt(2*x - 5)*sqrt(4*x + 1)*sqrt(5*x + 7), x)`

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{5x+7}\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((2-3*x)^(1/2)*(-5+2*x)^(1/2)*(1+4*x)^(1/2)*(7+5*x)^(1/2),x, algorithm="giac")`

[Out] `integrate(sqrt(5*x + 7)*sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2), x)`

$$3.80 \quad \int \frac{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{\sqrt{7+5x}} dx$$

Optimal. Leaf size=351

$$\frac{20057\sqrt{\frac{11}{23}}\sqrt{5x+7}\text{EllipticF}\left(\tan^{-1}\left(\frac{\sqrt{4x+1}}{\sqrt{2}\sqrt{2-3x}}\right), -\frac{39}{23}\right)}{1800\sqrt{2x-5}\sqrt{\frac{5x+7}{5-2x}}} + \frac{1}{10}\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}\sqrt{5x+7} - \frac{427\sqrt{2-3x}\sqrt{4x+1}\sqrt{5x+7}}{600\sqrt{2x-5}}$$

[Out] (-427*Sqrt[2 - 3*x]*Sqrt[1 + 4*x]*Sqrt[7 + 5*x])/(600*Sqrt[-5 + 2*x]) + (Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*Sqrt[7 + 5*x])/10 + (427*Sqrt[143/3]*Sqrt[2 - 3*x]*Sqrt[(7 + 5*x)/(5 - 2*x)]*EllipticE[ArcSin[(Sqrt[39/23]*Sqrt[1 + 4*x])/Sqrt[-5 + 2*x]], -23/39])/(400*Sqrt[(2 - 3*x)/(5 - 2*x)]*Sqrt[7 + 5*x]) - (20057*Sqrt[11/23]*Sqrt[7 + 5*x]*EllipticF[ArcTan[Sqrt[1 + 4*x]/(Sqrt[2]*Sqrt[2 - 3*x])], -39/23])/(1800*Sqrt[-5 + 2*x]*Sqrt[(7 + 5*x)/(5 - 2*x)]) + (1008833*(2 - 3*x)*Sqrt[(5 - 2*x)/(2 - 3*x)]*Sqrt[-((1 + 4*x)/(2 - 3*x))]*EllipticPi[-69/55, ArcSin[(Sqrt[11/23]*Sqrt[7 + 5*x])/Sqrt[2 - 3*x]], -23/39])/(9000*Sqrt[429]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])

Rubi [A] time = 0.323878, antiderivative size = 351, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 9, integrand size = 37, $\frac{\text{number of rules}}{\text{integrand size}} = 0.243$, Rules used = {161, 1602, 1598, 170, 418, 165, 537, 176, 424}

$$\frac{1}{10}\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}\sqrt{5x+7} - \frac{427\sqrt{2-3x}\sqrt{4x+1}\sqrt{5x+7}}{600\sqrt{2x-5}} - \frac{20057\sqrt{\frac{11}{23}}\sqrt{5x+7}\text{F}\left(\tan^{-1}\left(\frac{\sqrt{4x+1}}{\sqrt{2}\sqrt{2-3x}}\right)\middle| -\frac{39}{23}\right)}{1800\sqrt{2x-5}\sqrt{\frac{5x+7}{5-2x}}} +$$

Antiderivative was successfully verified.

[In] Int[(Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/Sqrt[7 + 5*x], x]

[Out] (-427*Sqrt[2 - 3*x]*Sqrt[1 + 4*x]*Sqrt[7 + 5*x])/(600*Sqrt[-5 + 2*x]) + (Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*Sqrt[7 + 5*x])/10 + (427*Sqrt[143/3]*Sqrt[2 - 3*x]*Sqrt[(7 + 5*x)/(5 - 2*x)]*EllipticE[ArcSin[(Sqrt[39/23]*Sqrt[1 + 4*x])/Sqrt[-5 + 2*x]], -23/39])/(400*Sqrt[(2 - 3*x)/(5 - 2*x)]*Sqrt[7 + 5*x]) - (20057*Sqrt[11/23]*Sqrt[7 + 5*x]*EllipticF[ArcTan[Sqrt[1 + 4*x]/(Sqrt[2]*Sqrt[2 - 3*x])], -39/23])/(1800*Sqrt[-5 + 2*x]*Sqrt[(7 + 5*x)/(5 - 2*x)]) + (1008833*(2 - 3*x)*Sqrt[(5 - 2*x)/(2 - 3*x)]*Sqrt[-((1 + 4*x)/(2 - 3*x))]*EllipticPi[-69/55, ArcSin[(Sqrt[11/23]*Sqrt[7 + 5*x])/Sqrt[2 - 3*x]], -23/39])/(9000*Sqrt[429]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])

x]], -23/39)]/(9000*Sqrt[429]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])

Rule 161

Int[((a_.) + (b_.)*(x_))^(m_)*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)], x_Symbol] := Simp[(2*(a + b*x)^(m + 1)*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(b*(2*m + 5)), x] + Dist[1/(b*(2*m + 5)), Int[((a + b*x)^m*Simp[3*b*c*e*g - a*(d*e*g + c*f*g + c*e*h) + 2*(b*(d*e*g + c*f*g + c*e*h) - a*(d*f*g + d*e*h + c*f*h))*x - (3*a*d*f*h - b*(d*f*g + d*e*h + c*f*h))*x^2, x])/(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]), x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m}, x] && IntegerQ[2*m] && !LtQ[m, -1]

Rule 1602

Int[((A_.) + (B_.)*(x_) + (C_.)*(x_)^2)/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Simp[(C*Sqrt[a + b*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(b*f*h*Sqrt[c + d*x]), x] + (Dist[1/(2*b*d*f*h), Int[(1*Simp[2*A*b*d*f*h - C*(b*d*e*g + a*c*f*h) + (2*b*B*d*f*h - C*(a*d*f*h + b*(d*f*g + d*e*h + c*f*h)))*x, x])/(Sqrt[a + b*x]*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]), x], x] + Dist[(C*(d*e - c*f)*(d*g - c*h))/(2*b*d*f*h), Int[Sqrt[a + b*x]/((c + d*x)^(3/2)*Sqrt[e + f*x]*Sqrt[g + h*x]), x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, A, B, C}, x]

Rule 1598

Int[((A_.) + (B_.)*(x_))/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Dist[(A*b - a*B)/b, Int[1/(Sqrt[a + b*x]*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]), x], x] + Dist[B/b, Int[Sqrt[a + b*x]/(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]), x], x] /; FreeQ[{a, b, c, d, e, f, g, h, A, B}, x]

Rule 170

Int[1/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Dist[(2*Sqrt[g + h*x]*Sqrt[(b*e - a*f)*(c + d*x)]/((d*e - c*f)*(a + b*x))]/((f*g - e*h)*Sqrt[c + d*x]*Sqrt[-(((b*e - a*f)*(g + h*x))/((f*g - e*h)*(a + b*x)))]), Subst[Int[1/(Sqrt[1 + ((b*c - a*d)*x^2)/(d*e - c*f)]*Sqrt[1 - ((b*g - a*h)*x^2)/(f*g - e*h)]), x], x, Sqrt[e + f*x]/Sqrt[a + b*x]], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x]

Rule 418

```
Int[1/(Sqrt[(a_) + (b_.)*(x_)^2]*Sqrt[(c_) + (d_.)*(x_)^2]), x_Symbol] := S
imp[(Sqrt[a + b*x^2]*EllipticF[ArcTan[Rt[d/c, 2]*x], 1 - (b*c)/(a*d)])/(a*R
t[d/c, 2]*Sqrt[c + d*x^2]*Sqrt[(c*(a + b*x^2))/(a*(c + d*x^2))]), x] /; Fre
eQ[{a, b, c, d}, x] && PosQ[d/c] && PosQ[b/a] && !SimplerSqrtQ[b/a, d/c]
```

Rule 165

```
Int[Sqrt[(a_.) + (b_.)*(x_)]/(Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(
x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Dist[(2*(a + b*x)*Sqrt[((b*g -
a*h)*(c + d*x))/((d*g - c*h)*(a + b*x))]*Sqrt[((b*g - a*h)*(e + f*x))/((f*
g - e*h)*(a + b*x))])/(Sqrt[c + d*x]*Sqrt[e + f*x]), Subst[Int[1/((h - b*x^
2)*Sqrt[1 + ((b*c - a*d)*x^2)/(d*g - c*h)]*Sqrt[1 + ((b*e - a*f)*x^2)/(f*g
- e*h)]), x], x, Sqrt[g + h*x]/Sqrt[a + b*x]], x] /; FreeQ[{a, b, c, d, e,
f, g, h}, x]
```

Rule 537

```
Int[1/(((a_) + (b_.)*(x_)^2)*Sqrt[(c_) + (d_.)*(x_)^2]*Sqrt[(e_) + (f_.)*(x
_)^2]), x_Symbol] := Simp[(1*EllipticPi[(b*c)/(a*d), ArcSin[Rt[-(d/c), 2]*x
], (c*f)/(d*e))]/(a*Sqrt[c]*Sqrt[e]*Rt[-(d/c), 2]), x] /; FreeQ[{a, b, c, d
, e, f}, x] && !GtQ[d/c, 0] && GtQ[c, 0] && GtQ[e, 0] && !( !GtQ[f/e, 0]
&& SimplerSqrtQ[-(f/e), -(d/c)])
```

Rule 176

```
Int[Sqrt[(c_.) + (d_.)*(x_)]/(((a_.) + (b_.)*(x_))^(3/2)*Sqrt[(e_.) + (f_.)
*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Dist[(-2*Sqrt[c + d*x]*Sqrt[
-(((b*e - a*f)*(g + h*x))/((f*g - e*h)*(a + b*x)))])/(b*e - a*f)*Sqrt[g +
h*x]*Sqrt[((b*e - a*f)*(c + d*x))/((d*e - c*f)*(a + b*x))]), Subst[Int[Sqrt
[1 + ((b*c - a*d)*x^2)/(d*e - c*f)]/Sqrt[1 - ((b*g - a*h)*x^2)/(f*g - e*h)]
, x], x, Sqrt[e + f*x]/Sqrt[a + b*x]], x] /; FreeQ[{a, b, c, d, e, f, g, h}
, x]
```

Rule 424

```
Int[Sqrt[(a_) + (b_.)*(x_)^2]/Sqrt[(c_) + (d_.)*(x_)^2], x_Symbol] := Simp[
(Sqrt[a]*EllipticE[ArcSin[Rt[-(d/c), 2]*x], (b*c)/(a*d)])/(Sqrt[c]*Rt[-(d/c
), 2]), x] /; FreeQ[{a, b, c, d}, x] && NegQ[d/c] && GtQ[c, 0] && GtQ[a, 0]
```

Rubi steps

$$\begin{aligned}
\int \frac{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{\sqrt{7+5x}} dx &= \frac{1}{10} \sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}\sqrt{7+5x} + \frac{1}{20} \int \frac{-3-1190x+854x^2}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}\sqrt{7+5x}} dx \\
&= -\frac{427\sqrt{2-3x}\sqrt{1+4x}\sqrt{7+5x}}{600\sqrt{-5+2x}} + \frac{1}{10} \sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}\sqrt{7+5x} - \frac{\int \frac{207}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}\sqrt{7+5x}} dx}{600} \\
&= -\frac{427\sqrt{2-3x}\sqrt{1+4x}\sqrt{7+5x}}{600\sqrt{-5+2x}} + \frac{1}{10} \sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}\sqrt{7+5x} + \frac{32543}{600} \int \frac{1}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}\sqrt{7+5x}} dx \\
&= -\frac{427\sqrt{2-3x}\sqrt{1+4x}\sqrt{7+5x}}{600\sqrt{-5+2x}} + \frac{1}{10} \sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}\sqrt{7+5x} + \frac{427\sqrt{\frac{143}{3}}}{600} \int \frac{1}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}\sqrt{7+5x}} dx \\
&= -\frac{427\sqrt{2-3x}\sqrt{1+4x}\sqrt{7+5x}}{600\sqrt{-5+2x}} + \frac{1}{10} \sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}\sqrt{7+5x} + \frac{427\sqrt{\frac{143}{3}}}{600} \int \frac{1}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}\sqrt{7+5x}} dx
\end{aligned}$$

Mathematica [A] time = 2.93339, size = 347, normalized size = 0.99

$$\sqrt{2x-5}\sqrt{4x+1}\sqrt{5x+7} \left(\frac{117924\sqrt{682}(3x-2)(5x+7)\sqrt{\frac{8x^2-18x-5}{(2-3x)^2}} \text{EllipticF}\left(\sin^{-1}\left(\sqrt{\frac{31}{39}}\sqrt{\frac{2x-5}{3x-2}}\right), \frac{39}{62}\right) - 238266\sqrt{682}(3x-2)(5x+7)\sqrt{\frac{8x^2-18x-5}{(2-3x)^2}} E\left(\sin^{-1}\left(\sqrt{\frac{31}{39}}\sqrt{\frac{2x-5}{3x-2}}\right), \frac{39}{62}\right)}{(5x+7)^{3/2}(3x-2)^{3/2}} \right)$$

669600

Warning: Unable to verify antiderivative.

[In] Integrate[(Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/Sqrt[7 + 5*x], x]

[Out] (Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*Sqrt[7 + 5*x]*(66960*(2 - 3*x) + (-238266*Sqrt[682]*(-2 + 3*x)*(7 + 5*x)*Sqrt[(-5 - 18*x + 8*x^2)/(2 - 3*x)^2]*EllipticE[ArcSin[Sqrt[31/39]*Sqrt[(-5 + 2*x)/(-2 + 3*x)]], 39/62] + 117924*Sqrt[682]*(-2 + 3*x)*(7 + 5*x)*Sqrt[(-5 - 18*x + 8*x^2)/(2 - 3*x)^2]*EllipticF[ArcSin[Sqrt[31/39]*Sqrt[(-5 + 2*x)/(-2 + 3*x)]], 39/62] - 7*Sqrt[(7 + 5*x)/(-2 + 3*x)]*(-102114*(-35 - 151*x - 34*x^2 + 40*x^3) + 13947*Sqrt[682]*(2 - 3*x)^2*Sqrt[(1 + 4*x)/(-2 + 3*x)]*Sqrt[(-35 - 11*x + 10*x^2)/(2 - 3*x)^2]*EllipticPi[117/62, ArcSin[Sqrt[31/39]*Sqrt[(-5 + 2*x)/(-2 + 3*x)]], 39/62]))/((2 - 3*x)*((7 + 5*x)/(-2 + 3*x))^(3/2)*(5 + 18*x - 8*x^2)))/(669600*Sqrt[2 -

3*x])

Maple [B] time = 0.03, size = 880, normalized size = 2.5

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] $\text{int}((2-3*x)^{(1/2)}*(2*x-5)^{(1/2)}*(4*x+1)^{(1/2)}/(7+5*x)^{(1/2)}, x)$

[Out] $1/5148000*(2-3*x)^{(1/2)}*(2*x-5)^{(1/2)}*(4*x+1)^{(1/2)}*(7+5*x)^{(1/2)}*(15321680*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}*3^{(1/2)}*13^{(1/2)}*((2*x-5)/(4*x+1))^{(1/2)}*((-2+3*x)/(4*x+1))^{(1/2)}*x^2*\text{EllipticF}(1/31*31^{(1/2)}*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}, 1/39*31^{(1/2)}*78^{(1/2)})+11975824*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}*3^{(1/2)}*13^{(1/2)}*((2*x-5)/(4*x+1))^{(1/2)}*((-2+3*x)/(4*x+1))^{(1/2)}*x^2*\text{EllipticPi}(1/31*31^{(1/2)}*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}, 124/55, 1/39*31^{(1/2)}*78^{(1/2)})-29309280*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}*3^{(1/2)}*13^{(1/2)}*((2*x-5)/(4*x+1))^{(1/2)}*((-2+3*x)/(4*x+1))^{(1/2)}*x^2*\text{EllipticE}(1/31*31^{(1/2)}*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}, 1/39*31^{(1/2)}*78^{(1/2)})+7660840*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}*3^{(1/2)}*13^{(1/2)}*((2*x-5)/(4*x+1))^{(1/2)}*((-2+3*x)/(4*x+1))^{(1/2)}*x*\text{EllipticF}(1/31*31^{(1/2)}*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}, 1/39*31^{(1/2)}*78^{(1/2)})+5987912*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}*3^{(1/2)}*13^{(1/2)}*((2*x-5)/(4*x+1))^{(1/2)}*((-2+3*x)/(4*x+1))^{(1/2)}*x*\text{EllipticPi}(1/31*31^{(1/2)}*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}, 124/55, 1/39*31^{(1/2)}*78^{(1/2)})-14654640*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}*3^{(1/2)}*13^{(1/2)}*((2*x-5)/(4*x+1))^{(1/2)}*((-2+3*x)/(4*x+1))^{(1/2)}*x*\text{EllipticE}(1/31*31^{(1/2)}*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}, 1/39*31^{(1/2)}*78^{(1/2)})+957605*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}*3^{(1/2)}*13^{(1/2)}*((2*x-5)/(4*x+1))^{(1/2)}*((-2+3*x)/(4*x+1))^{(1/2)}*\text{EllipticF}(1/31*31^{(1/2)}*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}, 1/39*31^{(1/2)}*78^{(1/2)})+748489*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}*3^{(1/2)}*13^{(1/2)}*((2*x-5)/(4*x+1))^{(1/2)}*((-2+3*x)/(4*x+1))^{(1/2)}*\text{EllipticPi}(1/31*31^{(1/2)}*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}, 124/55, 1/39*31^{(1/2)}*78^{(1/2)})-1831830*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}*3^{(1/2)}*13^{(1/2)}*((2*x-5)/(4*x+1))^{(1/2)}*((-2+3*x)/(4*x+1))^{(1/2)}*\text{EllipticE}(1/31*31^{(1/2)}*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}, 1/39*31^{(1/2)}*78^{(1/2)})-313513200*x^3+61776000*x^4+190149960*x^2+709583160*x-476876400)/(120*x^4-182*x^3-385*x^2+197*x+70)$

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2}}{\sqrt{5x+7}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2-3*x)^(1/2)*(-5+2*x)^(1/2)*(1+4*x)^(1/2)/(7+5*x)^(1/2),x, algorithm="maxima")

[Out] integrate(sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)/sqrt(5*x + 7), x)

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2}}{\sqrt{5x+7}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2-3*x)^(1/2)*(-5+2*x)^(1/2)*(1+4*x)^(1/2)/(7+5*x)^(1/2),x, algorithm="fricas")

[Out] integral(sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)/sqrt(5*x + 7), x)

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}}{\sqrt{5x+7}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2-3*x)**(1/2)*(-5+2*x)**(1/2)*(1+4*x)**(1/2)/(7+5*x)**(1/2),x)

[Out] Integral(sqrt(2 - 3*x)*sqrt(2*x - 5)*sqrt(4*x + 1)/sqrt(5*x + 7), x)

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2}}{\sqrt{5x+7}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((2-3*x)^(1/2)*(-5+2*x)^(1/2)*(1+4*x)^(1/2)/(7+5*x)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)/sqrt(5*x + 7), x)
```

$$3.81 \quad \int \frac{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{(7+5x)^{3/2}} dx$$

Optimal. Leaf size=349

$$\frac{296\sqrt{\frac{11}{23}}\sqrt{5x+7}\text{EllipticF}\left(\tan^{-1}\left(\frac{\sqrt{4x+1}}{\sqrt{2}\sqrt{2-3x}}\right), -\frac{39}{23}\right)}{75\sqrt{2x-5}\sqrt{\frac{5x+7}{5-2x}}} + \frac{6\sqrt{2-3x}\sqrt{4x+1}\sqrt{5x+7}}{25\sqrt{2x-5}} - \frac{2\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}}{5\sqrt{5x+7}} - \frac{3\sqrt{429}\sqrt{2-3x}}{5\sqrt{5x+7}}$$

```
[Out] (-2*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/(5*Sqrt[7 + 5*x]) + (6*Sqrt[2 - 3*x]*Sqrt[1 + 4*x]*Sqrt[7 + 5*x])/(25*Sqrt[-5 + 2*x]) - (3*Sqrt[429]*Sqrt[2 - 3*x]*Sqrt[(7 + 5*x)/(5 - 2*x)]*EllipticE[ArcSin[(Sqrt[39/23]*Sqrt[1 + 4*x])/Sqrt[-5 + 2*x]], -23/39])/(25*Sqrt[(2 - 3*x)/(5 - 2*x)]*Sqrt[7 + 5*x]) + (296*Sqrt[11/23]*Sqrt[7 + 5*x]*EllipticF[ArcTan[Sqrt[1 + 4*x]/(Sqrt[2]*Sqrt[2 - 3*x])], -39/23])/(75*Sqrt[-5 + 2*x]*Sqrt[(7 + 5*x)/(5 - 2*x)]) - (26474*(2 - 3*x)*Sqrt[(5 - 2*x)/(2 - 3*x)]*Sqrt[-((1 + 4*x)/(2 - 3*x))]*EllipticPi[-69/55, ArcSin[(Sqrt[11/23]*Sqrt[7 + 5*x])/Sqrt[2 - 3*x]], -23/39])/(375*Sqrt[429]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])
```

Rubi [A] time = 0.318856, antiderivative size = 349, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 9, integrand size = 37, $\frac{\text{number of rules}}{\text{integrand size}} = 0.243$, Rules used = {160, 1602, 1598, 170, 418, 165, 537, 176, 424}

$$\frac{6\sqrt{2-3x}\sqrt{4x+1}\sqrt{5x+7}}{25\sqrt{2x-5}} - \frac{2\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}}{5\sqrt{5x+7}} + \frac{296\sqrt{\frac{11}{23}}\sqrt{5x+7}F\left(\tan^{-1}\left(\frac{\sqrt{4x+1}}{\sqrt{2}\sqrt{2-3x}}\right) \middle| -\frac{39}{23}\right)}{75\sqrt{2x-5}\sqrt{\frac{5x+7}{5-2x}}} - \frac{3\sqrt{429}\sqrt{2-3x}}{5\sqrt{5x+7}}$$

Antiderivative was successfully verified.

[In] Int[(Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/(7 + 5*x)^(3/2), x]

```
[Out] (-2*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/(5*Sqrt[7 + 5*x]) + (6*Sqrt[2 - 3*x]*Sqrt[1 + 4*x]*Sqrt[7 + 5*x])/(25*Sqrt[-5 + 2*x]) - (3*Sqrt[429]*Sqrt[2 - 3*x]*Sqrt[(7 + 5*x)/(5 - 2*x)]*EllipticE[ArcSin[(Sqrt[39/23]*Sqrt[1 + 4*x])/Sqrt[-5 + 2*x]], -23/39])/(25*Sqrt[(2 - 3*x)/(5 - 2*x)]*Sqrt[7 + 5*x]) + (296*Sqrt[11/23]*Sqrt[7 + 5*x]*EllipticF[ArcTan[Sqrt[1 + 4*x]/(Sqrt[2]*Sqrt[2 - 3*x])], -39/23])/(75*Sqrt[-5 + 2*x]*Sqrt[(7 + 5*x)/(5 - 2*x)]) - (26474*(2 - 3*x)*Sqrt[(5 - 2*x)/(2 - 3*x)]*Sqrt[-((1 + 4*x)/(2 - 3*x))]*EllipticPi[-69/55, ArcSin[(Sqrt[11/23]*Sqrt[7 + 5*x])/Sqrt[2 - 3*x]], -23/39])/(375*Sqrt[429]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])
```

)]/(375*Sqrt[429]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])

Rule 160

```
Int[((a_.) + (b_.)*(x_))^(m_)*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)], x_Symbol] := Simp[((a + b*x)^(m + 1)*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(b*(m + 1)), x] - Dist[1/(2*b*(m + 1)), Int[((a + b*x)^(m + 1)*Simp[d*e*g + c*f*g + c*e*h + 2*(d*f*g + d*e*h + c*f*h)*x + 3*d*f*h*x^2, x])/(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]), x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m}, x] && IntegerQ[2*m] && LtQ[m, -1]
```

Rule 1602

```
Int[((A_.) + (B_.)*(x_) + (C_.)*(x_)^2)/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Simp[(C*Sqrt[a + b*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(b*f*h*Sqrt[c + d*x]), x] + (Dist[1/(2*b*d*f*h), Int[(1*Simp[2*A*b*d*f*h - C*(b*d*e*g + a*c*f*h) + (2*b*B*d*f*h - C*(a*d*f*h + b*(d*f*g + d*e*h + c*f*h)))*x, x])/(Sqrt[a + b*x]*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]), x], x] + Dist[(C*(d*e - c*f)*(d*g - c*h))/(2*b*d*f*h), Int[Sqrt[a + b*x]/((c + d*x)^(3/2)*Sqrt[e + f*x]*Sqrt[g + h*x]), x], x] /; FreeQ[{a, b, c, d, e, f, g, h, A, B, C}, x]
```

Rule 1598

```
Int[((A_.) + (B_.)*(x_))/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Dist[(A*B - a*B)/b, Int[1/(Sqrt[a + b*x]*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]), x], x] + Dist[B/b, Int[Sqrt[a + b*x]/(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]), x], x] /; FreeQ[{a, b, c, d, e, f, g, h, A, B}, x]
```

Rule 170

```
Int[1/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Dist[(2*Sqrt[g + h*x]*Sqrt[(b*e - a*f)*(c + d*x)]/((d*e - c*f)*(a + b*x)))/((f*g - e*h)*Sqrt[c + d*x]*Sqrt[-((b*e - a*f)*(g + h*x))/((f*g - e*h)*(a + b*x))]), Subst[Int[1/(Sqrt[1 + ((b*c - a*d)*x^2)/(d*e - c*f)]*Sqrt[1 - ((b*g - a*h)*x^2)/(f*g - e*h])], x], x, Sqrt[e + f*x]/Sqrt[a + b*x]], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x]
```

Rule 418

```
Int[1/(Sqrt[(a_.) + (b_.)*(x_)^2]*Sqrt[(c_.) + (d_.)*(x_)^2]), x_Symbol] := Simp[(Sqrt[a + b*x^2]*EllipticF[ArcTan[Rt[d/c, 2]*x], 1 - (b*c)/(a*d)])/(a*R
```

```
t[d/c, 2]*Sqrt[c + d*x^2]*Sqrt[(c*(a + b*x^2))/(a*(c + d*x^2))], x] /; FreeQ[{a, b, c, d}, x] && PosQ[d/c] && PosQ[b/a] && !SimplerSqrtQ[b/a, d/c]
```

Rule 165

```
Int[Sqrt[(a_.) + (b_.)*(x_)]/(Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Dist[(2*(a + b*x)*Sqrt[((b*g - a*h)*(c + d*x))/((d*g - c*h)*(a + b*x))]*Sqrt[((b*g - a*h)*(e + f*x))/((f*g - e*h)*(a + b*x))])/(Sqrt[c + d*x]*Sqrt[e + f*x]), Subst[Int[1/((h - b*x^2)*Sqrt[1 + ((b*c - a*d)*x^2]/(d*g - c*h)]*Sqrt[1 + ((b*e - a*f)*x^2)/(f*g - e*h)]), x], x, Sqrt[g + h*x]/Sqrt[a + b*x]], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x]
```

Rule 537

```
Int[1/(((a_) + (b_.)*(x_)^2)*Sqrt[(c_) + (d_.)*(x_)^2]*Sqrt[(e_) + (f_.)*(x_)^2]), x_Symbol] := Simp[(1*EllipticPi[(b*c)/(a*d), ArcSin[Rt[-(d/c), 2]*x], (c*f)/(d*e)]/(a*Sqrt[c]*Sqrt[e]*Rt[-(d/c), 2]), x] /; FreeQ[{a, b, c, d, e, f}, x] && !GtQ[d/c, 0] && GtQ[c, 0] && GtQ[e, 0] && !( !GtQ[f/e, 0] && SimplerSqrtQ[-(f/e), -(d/c)])
```

Rule 176

```
Int[Sqrt[(c_.) + (d_.)*(x_)]/(((a_.) + (b_.)*(x_)^(3/2)*Sqrt[(e_.) + (f_.)*(x_)^2]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Dist[(-2*Sqrt[c + d*x]*Sqrt[-((b*e - a*f)*(g + h*x))/((f*g - e*h)*(a + b*x))])/(b*e - a*f)*Sqrt[g + h*x]*Sqrt[((b*e - a*f)*(c + d*x))/((d*e - c*f)*(a + b*x))], Subst[Int[Sqrt[1 + ((b*c - a*d)*x^2)/(d*e - c*f)]/Sqrt[1 - ((b*g - a*h)*x^2)/(f*g - e*h)], x], x, Sqrt[e + f*x]/Sqrt[a + b*x]], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x]
```

Rule 424

```
Int[Sqrt[(a_) + (b_.)*(x_)^2]/Sqrt[(c_) + (d_.)*(x_)^2], x_Symbol] := Simp[(Sqrt[a]*EllipticE[ArcSin[Rt[-(d/c), 2]*x], (b*c)/(a*d)]/(Sqrt[c]*Rt[-(d/c), 2]), x] /; FreeQ[{a, b, c, d}, x] && NegQ[d/c] && GtQ[c, 0] && GtQ[a, 0]
```

Rubi steps

$$\begin{aligned}
\int \frac{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{(7+5x)^{3/2}} dx &= -\frac{2\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{5\sqrt{7+5x}} + \frac{1}{5} \int \frac{-21+140x-72x^2}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}\sqrt{7+5x}} dx \\
&= -\frac{2\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{5\sqrt{7+5x}} + \frac{6\sqrt{2-3x}\sqrt{1+4x}\sqrt{7+5x}}{25\sqrt{-5+2x}} - \frac{\int \frac{-12384-20496x}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}\sqrt{7+5x}} dx}{1200} \\
&= -\frac{2\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{5\sqrt{7+5x}} + \frac{6\sqrt{2-3x}\sqrt{1+4x}\sqrt{7+5x}}{25\sqrt{-5+2x}} - \frac{427}{75} \int \frac{\sqrt{2-3x}}{\sqrt{-5+2x}\sqrt{1+4x}} dx \\
&= -\frac{2\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{5\sqrt{7+5x}} + \frac{6\sqrt{2-3x}\sqrt{1+4x}\sqrt{7+5x}}{25\sqrt{-5+2x}} - \frac{3\sqrt{429}\sqrt{2-3x}\sqrt{\frac{7+5x}{5-2x}} E}{25\sqrt{\frac{2-3x}{5-2x}}} \\
&= -\frac{2\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{5\sqrt{7+5x}} + \frac{6\sqrt{2-3x}\sqrt{1+4x}\sqrt{7+5x}}{25\sqrt{-5+2x}} - \frac{3\sqrt{429}\sqrt{2-3x}\sqrt{\frac{7+5x}{5-2x}} E}{25\sqrt{\frac{2-3x}{5-2x}}}
\end{aligned}$$

Mathematica [A] time = 2.79307, size = 330, normalized size = 0.95

$$\sqrt{2x-5}\sqrt{4x+1} \left(262\sqrt{682}\sqrt{\frac{8x^2-18x-5}{(2-3x)^2}} (15x^2+11x-14) \text{EllipticF}\left(\sin^{-1}\left(\sqrt{\frac{31}{39}}\sqrt{\frac{2x-5}{3x-2}}\right), \frac{39}{62}\right) - 558\sqrt{682}\sqrt{\frac{8x^2-18x-5}{(2-3x)^2}} (15x^2+11x-14) \text{EllipticE}\left(\sin^{-1}\left(\sqrt{\frac{31}{39}}\sqrt{\frac{2x-5}{3x-2}}\right), \frac{39}{62}\right) \right)$$

Warning: Unable to verify antiderivative.

[In] Integrate[(Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/(7 + 5*x)^(3/2), x]

[Out] -(Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(-558*Sqrt[682]*Sqrt[(-5 - 18*x + 8*x^2)/(2 - 3*x)^2]*(-14 + 11*x + 15*x^2)*EllipticE[ArcSin[Sqrt[31/39]*Sqrt[(-5 + 2*x)/(-2 + 3*x)]], 39/62] + 262*Sqrt[682]*Sqrt[(-5 - 18*x + 8*x^2)/(2 - 3*x)^2]*(-14 + 11*x + 15*x^2)*EllipticF[ArcSin[Sqrt[31/39]*Sqrt[(-5 + 2*x)/(-2 + 3*x)]], 39/62] + Sqrt[(7 + 5*x)/(-2 + 3*x)]*(186*(-415 - 1569*x + 394*x^2 + 120*x^3) - 427*Sqrt[682]*(2 - 3*x)^2*Sqrt[(1 + 4*x)/(-2 + 3*x)]*Sqrt[(-35 - 11*x + 10*x^2)/(2 - 3*x)^2]*EllipticPi[117/62, ArcSin[Sqrt[31/39]*Sqrt[(-5 + 2*x)/(-2 + 3*x)]], 39/62]))/(4650*Sqrt[2 - 3*x]*Sqrt[7 + 5*x]*Sqrt[(7 + 5*x)/(-2 + 3*x)]*(-5 - 18*x + 8*x^2))

Maple [B] time = 0.041, size = 875, normalized size = 2.5

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] $\text{int}((2-3*x)^{(1/2)}*(2*x-5)^{(1/2)}*(4*x+1)^{(1/2)}/(7+5*x)^{(3/2)}, x)$

[Out] $-1/107250*(2-3*x)^{(1/2)}*(2*x-5)^{(1/2)}*(4*x+1)^{(1/2)}*(7+5*x)^{(1/2)}*(157520*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}*3^{(1/2)}*13^{(1/2)}*((2*x-5)/(4*x+1))^{(1/2)}*((-2+3*x)/(4*x+1))^{(1/2)}*x^2*\text{EllipticF}(1/31*31^{(1/2)}*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}, 1/39*31^{(1/2)}*78^{(1/2)})+157136*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}*3^{(1/2)}*13^{(1/2)}*((2*x-5)/(4*x+1))^{(1/2)}*((-2+3*x)/(4*x+1))^{(1/2)}*x^2*\text{EllipticPi}(1/31*31^{(1/2)}*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}, 124/55, 1/39*31^{(1/2)}*78^{(1/2)})-205920*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}*3^{(1/2)}*13^{(1/2)}*((2*x-5)/(4*x+1))^{(1/2)}*((-2+3*x)/(4*x+1))^{(1/2)}*x^2*\text{EllipticE}(1/31*31^{(1/2)}*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}, 1/39*31^{(1/2)}*78^{(1/2)})+78760*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}*3^{(1/2)}*13^{(1/2)}*((2*x-5)/(4*x+1))^{(1/2)}*((-2+3*x)/(4*x+1))^{(1/2)}*x*\text{EllipticF}(1/31*31^{(1/2)}*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}, 1/39*31^{(1/2)}*78^{(1/2)})+78568*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}*3^{(1/2)}*13^{(1/2)}*((2*x-5)/(4*x+1))^{(1/2)}*((-2+3*x)/(4*x+1))^{(1/2)}*x*\text{EllipticPi}(1/31*31^{(1/2)}*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}, 124/55, 1/39*31^{(1/2)}*78^{(1/2)})-102960*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}*3^{(1/2)}*13^{(1/2)}*((2*x-5)/(4*x+1))^{(1/2)}*((-2+3*x)/(4*x+1))^{(1/2)}*x*\text{EllipticE}(1/31*31^{(1/2)}*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}, 1/39*31^{(1/2)}*78^{(1/2)})+9845*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}*3^{(1/2)}*13^{(1/2)}*((2*x-5)/(4*x+1))^{(1/2)}*((-2+3*x)/(4*x+1))^{(1/2)}*\text{EllipticF}(1/31*31^{(1/2)}*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}, 1/39*31^{(1/2)}*78^{(1/2)})+9821*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}*3^{(1/2)}*13^{(1/2)}*((2*x-5)/(4*x+1))^{(1/2)}*((-2+3*x)/(4*x+1))^{(1/2)}*\text{EllipticPi}(1/31*31^{(1/2)}*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}, 124/55, 1/39*31^{(1/2)}*78^{(1/2)})-12870*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}*3^{(1/2)}*13^{(1/2)}*((2*x-5)/(4*x+1))^{(1/2)}*((-2+3*x)/(4*x+1))^{(1/2)}*\text{EllipticE}(1/31*31^{(1/2)}*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}, 1/39*31^{(1/2)}*78^{(1/2)})-514800*x^3-274560*x^2+5173740*x-3174600)/(120*x^4-182*x^3-385*x^2+197*x+70)$

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2}}{(5x+7)^{\frac{3}{2}}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2-3*x)^(1/2)*(-5+2*x)^(1/2)*(1+4*x)^(1/2)/(7+5*x)^(3/2),x, algorithm="maxima")

[Out] integrate(sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)/(5*x + 7)^(3/2), x)

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{5x+7}\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2}}{25x^2+70x+49}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2-3*x)^(1/2)*(-5+2*x)^(1/2)*(1+4*x)^(1/2)/(7+5*x)^(3/2),x, algorithm="fricas")

[Out] integral(sqrt(5*x + 7)*sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)/(25*x^2 + 70*x + 49), x)

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}}{(5x+7)^{\frac{3}{2}}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2-3*x)**(1/2)*(-5+2*x)**(1/2)*(1+4*x)**(1/2)/(7+5*x)**(3/2),x)

[Out] Integral(sqrt(2 - 3*x)*sqrt(2*x - 5)*sqrt(4*x + 1)/(5*x + 7)**(3/2), x)

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2}}{(5x+7)^{\frac{3}{2}}} dx$$

Verification of antiderivative is not currently implemented for this CAS.


```
[In] integrate((2-3*x)^(1/2)*(-5+2*x)^(1/2)*(1+4*x)^(1/2)/(7+5*x)^(3/2),x, algorithm="giac")
```

```
[Out] integrate(sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)/(5*x + 7)^(3/2), x)
```

$$3.82 \quad \int \frac{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{(7+5x)^{5/2}} dx$$

Optimal. Leaf size=391

$$-\frac{496\sqrt{\frac{11}{23}}\sqrt{5x+7}\text{EllipticF}\left(\tan^{-1}\left(\frac{\sqrt{4x+1}}{\sqrt{2}\sqrt{2-3x}}\right), -\frac{39}{23}\right)}{1725\sqrt{2x-5}\sqrt{\frac{5x+7}{5-2x}}} - \frac{35812\sqrt{2-3x}\sqrt{4x+1}\sqrt{5x+7}}{2085525\sqrt{2x-5}} + \frac{17906\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}}{417105\sqrt{5x+7}}$$

```
[Out] (-2*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/(15*(7 + 5*x)^(3/2)) + (17906*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/(417105*Sqrt[7 + 5*x]) - (35812*Sqrt[2 - 3*x]*Sqrt[1 + 4*x]*Sqrt[7 + 5*x])/(2085525*Sqrt[-5 + 2*x]) + (17906*Sqrt[11/39]*Sqrt[2 - 3*x]*Sqrt[(7 + 5*x)/(5 - 2*x)]*EllipticE[ArcSin[(Sqrt[39/23]*Sqrt[1 + 4*x])/Sqrt[-5 + 2*x]], -23/39])/(53475*Sqrt[(2 - 3*x)/(5 - 2*x)]*Sqrt[7 + 5*x]) - (496*Sqrt[11/23]*Sqrt[7 + 5*x]*EllipticF[ArcTan[Sqrt[1 + 4*x]/(Sqrt[2]*Sqrt[2 - 3*x])], -39/23])/(1725*Sqrt[-5 + 2*x]*Sqrt[(7 + 5*x)/(5 - 2*x)]) + (496*(2 - 3*x)*Sqrt[(5 - 2*x)/(2 - 3*x)]*Sqrt[-((1 + 4*x)/(2 - 3*x))]*EllipticPi[-69/55, ArcSin[(Sqrt[11/23]*Sqrt[7 + 5*x])/Sqrt[2 - 3*x]], -23/39])/(125*Sqrt[429]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])
```

Rubi [A] time = 0.429386, antiderivative size = 391, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 10, integrand size = 37, $\frac{\text{number of rules}}{\text{integrand size}} = 0.27$, Rules used = {160, 1604, 1602, 1598, 170, 418, 165, 537, 176, 424}

$$-\frac{35812\sqrt{2-3x}\sqrt{4x+1}\sqrt{5x+7}}{2085525\sqrt{2x-5}} + \frac{17906\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}}{417105\sqrt{5x+7}} - \frac{2\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}}{15(5x+7)^{3/2}} - \frac{496\sqrt{\frac{11}{23}}\sqrt{5x+7}F\left(\tan^{-1}\left(\frac{\sqrt{4x+1}}{\sqrt{2}\sqrt{2-3x}}\right), -\frac{39}{23}\right)}{1725\sqrt{2x-5}}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/(7 + 5*x)^(5/2), x]
```

```
[Out] (-2*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/(15*(7 + 5*x)^(3/2)) + (17906*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/(417105*Sqrt[7 + 5*x]) - (35812*Sqrt[2 - 3*x]*Sqrt[1 + 4*x]*Sqrt[7 + 5*x])/(2085525*Sqrt[-5 + 2*x]) + (17906*Sqrt[11/39]*Sqrt[2 - 3*x]*Sqrt[(7 + 5*x)/(5 - 2*x)]*EllipticE[ArcSin[(Sqrt[39/23]*Sqrt[1 + 4*x])/Sqrt[-5 + 2*x]], -23/39])/(53475*Sqrt[(2 - 3*x)/(5 - 2*x)]*Sqrt[7 + 5*x]) - (496*Sqrt[11/23]*Sqrt[7 + 5*x]*EllipticF[ArcTan[Sqrt[1 + 4*x]/(Sqrt[2]*Sqrt[2 - 3*x])], -39/23])/(1725*Sqrt[-5 + 2*x]*Sqrt[(7 + 5*x)/(5 - 2*x)]) + (496*(2 - 3*x)*Sqrt[(5 - 2*x)/(2 - 3*x)]*Sqrt[-((1 + 4*x)/(2 - 3*x))]*EllipticPi[-69/55, ArcSin[(Sqrt[11/23]*Sqrt[7 + 5*x])/Sqrt[2 - 3*x]], -23/39])/(125*Sqrt[429]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])
```

$(1 + 4x)/(2 - 3x)) * \text{EllipticPi}[-69/55, \text{ArcSin}[(\text{Sqrt}[11/23] * \text{Sqrt}[7 + 5x]) / \text{Sqrt}[2 - 3x]], -23/39)] / (125 * \text{Sqrt}[429] * \text{Sqrt}[-5 + 2x] * \text{Sqrt}[1 + 4x])$

Rule 160

$\text{Int}[(a_. + (b_.)(x_))^{(m_)} * \text{Sqrt}[(c_.) + (d_.)(x_)] * \text{Sqrt}[(e_.) + (f_.)(x_)] * \text{Sqrt}[(g_.) + (h_.)(x_)], x_Symbol] \rightarrow \text{Simp}[(a + b*x)^{(m + 1)} * \text{Sqrt}[c + d*x] * \text{Sqrt}[e + f*x] * \text{Sqrt}[g + h*x] / (b*(m + 1)), x] - \text{Dist}[1/(2*b*(m + 1)), \text{Int}[(a + b*x)^{(m + 1)} * \text{Simp}[d*e*g + c*f*g + c*e*h + 2*(d*f*g + d*e*h + c*f*h)*x + 3*d*f*h*x^2, x]] / (\text{Sqrt}[c + d*x] * \text{Sqrt}[e + f*x] * \text{Sqrt}[g + h*x]), x], x] /; \text{FreeQ}\{a, b, c, d, e, f, g, h, m\}, x\} \&\& \text{IntegerQ}[2*m] \&\& \text{LtQ}[m, -1]$

Rule 1604

$\text{Int}[(a_. + (b_.)(x_))^{(m_)} * ((A_.) + (B_.)(x_) + (C_.)(x_)^2)] / (\text{Sqrt}[(c_.) + (d_.)(x_)] * \text{Sqrt}[(e_.) + (f_.)(x_)] * \text{Sqrt}[(g_.) + (h_.)(x_)]), x_Symbol] \rightarrow \text{Simp}[(A*b^2 - a*b*B + a^2*C)*(a + b*x)^{(m + 1)} * \text{Sqrt}[c + d*x] * \text{Sqrt}[e + f*x] * \text{Sqrt}[g + h*x] / ((m + 1)*(b*c - a*d)*(b*e - a*f)*(b*g - a*h)), x] - \text{Dist}[1/(2*(m + 1)*(b*c - a*d)*(b*e - a*f)*(b*g - a*h)), \text{Int}[(a + b*x)^{(m + 1)} / (\text{Sqrt}[c + d*x] * \text{Sqrt}[e + f*x] * \text{Sqrt}[g + h*x])] * \text{Simp}[A*(2*a^2*d*f*h*(m + 1) - 2*a*b*(m + 1)*(d*f*g + d*e*h + c*f*h) + b^2*(2*m + 3)*(d*e*g + c*f*g + c*e*h)) - (b*B - a*C)*(a*(d*e*g + c*f*g + c*e*h) + 2*b*c*e*g*(m + 1)) - 2*((A*b - a*B)*(a*d*f*h*(m + 1) - b*(m + 2)*(d*f*g + d*e*h + c*f*h)) - C*(a^2*(d*f*g + d*e*h + c*f*h) - b^2*c*e*g*(m + 1) + a*b*(m + 1)*(d*e*g + c*f*g + c*e*h)))*x + d*f*h*(2*m + 5)*(A*b^2 - a*b*B + a^2*C)*x^2, x], x], x] /; \text{FreeQ}\{a, b, c, d, e, f, g, h, A, B, C\}, x\} \&\& \text{IntegerQ}[2*m] \&\& \text{LtQ}[m, -1]$

Rule 1602

$\text{Int}[(A_.) + (B_.)(x_) + (C_.)(x_)^2] / (\text{Sqrt}[(a_.) + (b_.)(x_)] * \text{Sqrt}[(c_.) + (d_.)(x_)] * \text{Sqrt}[(e_.) + (f_.)(x_)] * \text{Sqrt}[(g_.) + (h_.)(x_)]), x_Symbol] \rightarrow \text{Simp}[(C * \text{Sqrt}[a + b*x] * \text{Sqrt}[e + f*x] * \text{Sqrt}[g + h*x]) / (b*f*h * \text{Sqrt}[c + d*x]), x] + (\text{Dist}[1/(2*b*d*f*h), \text{Int}[(1 * \text{Simp}[2*A*b*d*f*h - C*(b*d*e*g + a*c*f*h) + (2*b*B*d*f*h - C*(a*d*f*h + b*(d*f*g + d*e*h + c*f*h)))*x, x]] / (\text{Sqrt}[a + b*x] * \text{Sqrt}[c + d*x] * \text{Sqrt}[e + f*x] * \text{Sqrt}[g + h*x]), x], x] + \text{Dist}[(C*(d*e - c*f)*(d*g - c*h)) / (2*b*d*f*h), \text{Int}[\text{Sqrt}[a + b*x] / ((c + d*x)^{(3/2)} * \text{Sqrt}[e + f*x] * \text{Sqrt}[g + h*x]), x], x]) /; \text{FreeQ}\{a, b, c, d, e, f, g, h, A, B, C\}, x]$

Rule 1598

$\text{Int}[(A_.) + (B_.)(x_)] / (\text{Sqrt}[(a_.) + (b_.)(x_)] * \text{Sqrt}[(c_.) + (d_.)(x_)] * \text{Sqrt}[(e_.) + (f_.)(x_)] * \text{Sqrt}[(g_.) + (h_.)(x_)]), x_Symbol] \rightarrow \text{Dist}[(A*b - a*B)/b, \text{Int}[1/(\text{Sqrt}[a + b*x] * \text{Sqrt}[c + d*x] * \text{Sqrt}[e + f*x] * \text{Sqrt}[g + h*x]), x], x] + \text{Dist}[B/b, \text{Int}[\text{Sqrt}[a + b*x] / (\text{Sqrt}[c + d*x] * \text{Sqrt}[e + f*x] * \text{Sqrt}[g +$

$h*x]), x], x] /; \text{FreeQ}\{a, b, c, d, e, f, g, h, A, B\}, x]$

Rule 170

$\text{Int}[1/(\text{Sqrt}[(a_.) + (b_.)*(x_)]*\text{Sqrt}[(c_.) + (d_.)*(x_)]*\text{Sqrt}[(e_.) + (f_.)*(x_)]*\text{Sqrt}[(g_.) + (h_.)*(x_)]), x_Symbol] \rightarrow \text{Dist}[(2*\text{Sqrt}[g + h*x]*\text{Sqrt}[(b*e - a*f)*(c + d*x)]/((d*e - c*f)*(a + b*x))]/((f*g - e*h)*\text{Sqrt}[c + d*x]*\text{Sqrt}[-(b*e - a*f)*(g + h*x)/(f*g - e*h)*(a + b*x)]), \text{Subst}[\text{Int}[1/(\text{Sqrt}[1 + ((b*c - a*d)*x^2)/(d*e - c*f)]*\text{Sqrt}[1 - ((b*g - a*h)*x^2)/(f*g - e*h)]), x], x, \text{Sqrt}[e + f*x]/\text{Sqrt}[a + b*x]], x] /; \text{FreeQ}\{a, b, c, d, e, f, g, h\}, x]$

Rule 418

$\text{Int}[1/(\text{Sqrt}[(a_.) + (b_.)*(x_)^2]*\text{Sqrt}[(c_.) + (d_.)*(x_)^2]), x_Symbol] \rightarrow \text{Simp}[(\text{Sqrt}[a + b*x^2]*\text{EllipticF}[\text{ArcTan}[\text{Rt}[d/c, 2]*x], 1 - (b*c)/(a*d)]/(a*\text{Rt}[d/c, 2]*\text{Sqrt}[c + d*x^2]*\text{Sqrt}[(c*(a + b*x^2))/(a*(c + d*x^2))]), x] /; \text{FreeQ}\{a, b, c, d\}, x] \&\& \text{PosQ}[d/c] \&\& \text{PosQ}[b/a] \&\& !\text{SimplerSqrtQ}[b/a, d/c]$

Rule 165

$\text{Int}[\text{Sqrt}[(a_.) + (b_.)*(x_)]/(\text{Sqrt}[(c_.) + (d_.)*(x_)]*\text{Sqrt}[(e_.) + (f_.)*(x_)]*\text{Sqrt}[(g_.) + (h_.)*(x_)]), x_Symbol] \rightarrow \text{Dist}[(2*(a + b*x)*\text{Sqrt}[(b*g - a*h)*(c + d*x)]/((d*g - c*h)*(a + b*x))]*\text{Sqrt}[(b*g - a*h)*(e + f*x)]/((f*g - e*h)*(a + b*x))]/(\text{Sqrt}[c + d*x]*\text{Sqrt}[e + f*x]), \text{Subst}[\text{Int}[1/((h - b*x^2)*\text{Sqrt}[1 + ((b*c - a*d)*x^2)/(d*g - c*h)]*\text{Sqrt}[1 + ((b*e - a*f)*x^2)/(f*g - e*h)]), x], x, \text{Sqrt}[g + h*x]/\text{Sqrt}[a + b*x]], x] /; \text{FreeQ}\{a, b, c, d, e, f, g, h\}, x]$

Rule 537

$\text{Int}[1/(((a_.) + (b_.)*(x_)^2)*\text{Sqrt}[(c_.) + (d_.)*(x_)^2]*\text{Sqrt}[(e_.) + (f_.)*(x_)^2]), x_Symbol] \rightarrow \text{Simp}[(1*\text{EllipticPi}[(b*c)/(a*d), \text{ArcSin}[\text{Rt}[-(d/c), 2]*x], (c*f)/(d*e)]/(a*\text{Sqrt}[c]*\text{Sqrt}[e]*\text{Rt}[-(d/c), 2]), x] /; \text{FreeQ}\{a, b, c, d, e, f\}, x] \&\& !\text{GtQ}[d/c, 0] \&\& \text{GtQ}[c, 0] \&\& \text{GtQ}[e, 0] \&\& !(!\text{GtQ}[f/e, 0] \&\& \text{SimplerSqrtQ}[-(f/e), -(d/c)])]$

Rule 176

$\text{Int}[\text{Sqrt}[(c_.) + (d_.)*(x_)]/(((a_.) + (b_.)*(x_)^(3/2)*\text{Sqrt}[(e_.) + (f_.)*(x_)]*\text{Sqrt}[(g_.) + (h_.)*(x_)]), x_Symbol] \rightarrow \text{Dist}[(-2*\text{Sqrt}[c + d*x]*\text{Sqrt}[-(b*e - a*f)*(g + h*x)/(f*g - e*h)*(a + b*x)])]/((b*e - a*f)*\text{Sqrt}[g + h*x]*\text{Sqrt}[(b*e - a*f)*(c + d*x)]/((d*e - c*f)*(a + b*x))), \text{Subst}[\text{Int}[\text{Sqrt}[1 + ((b*c - a*d)*x^2)/(d*e - c*f)]/\text{Sqrt}[1 - ((b*g - a*h)*x^2)/(f*g - e*h)], x], x, \text{Sqrt}[e + f*x]/\text{Sqrt}[a + b*x]], x] /; \text{FreeQ}\{a, b, c, d, e, f, g, h\}$

, x]

Rule 424

```
Int[Sqrt[(a_) + (b_.)*(x_)^2]/Sqrt[(c_) + (d_.)*(x_)^2], x_Symbol] := Simp[
(Sqrt[a]*EllipticE[ArcSin[Rt[-(d/c), 2]*x], (b*c)/(a*d)]/(Sqrt[c]*Rt[-(d/c)
), 2]), x] /; FreeQ[{a, b, c, d}, x] && NegQ[d/c] && GtQ[c, 0] && GtQ[a, 0]
```

Rubi steps

$$\begin{aligned}
\int \frac{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{(7+5x)^{5/2}} dx &= -\frac{2\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{15(7+5x)^{3/2}} + \frac{1}{15} \int \frac{-21+140x-72x^2}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^{3/2}} dx \\
&= -\frac{2\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{15(7+5x)^{3/2}} + \frac{17906\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{417105\sqrt{7+5x}} + \frac{\int \frac{40642-726310x}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}} dx}{417105} \\
&= -\frac{2\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{15(7+5x)^{3/2}} + \frac{17906\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{417105\sqrt{7+5x}} - \frac{35812\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{2085525} \\
&= -\frac{2\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{15(7+5x)^{3/2}} + \frac{17906\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{417105\sqrt{7+5x}} - \frac{35812\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{2085525} \\
&= -\frac{2\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{15(7+5x)^{3/2}} + \frac{17906\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{417105\sqrt{7+5x}} - \frac{35812\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{2085525} \\
&= -\frac{2\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{15(7+5x)^{3/2}} + \frac{17906\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{417105\sqrt{7+5x}} - \frac{35812\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{2085525}
\end{aligned}$$

Mathematica [A] time = 2.97431, size = 366, normalized size = 0.94

$$\sqrt{2x-5}\sqrt{4x+1}\sqrt{5x+7} \left(\frac{30\sqrt{6-9x}(44765x+34864)}{(5x+7)^2} - \frac{2\left(-37053\sqrt{682}(3x-2)(5x+7)\sqrt{\frac{8x^2-18x-5}{(2-3x)^2}}\text{EllipticF}\left(\sin^{-1}\left(\sqrt{\frac{31}{39}}\sqrt{\frac{2x-5}{3x-2}}\right), \frac{39}{62}\right)+80577\sqrt{682}(3x-2)\right)}{(5x+7)^2} \right)$$

625

Warning: Unable to verify antiderivative.

[In] Integrate[(Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/(7 + 5*x)^(5/2), x]

[Out] (Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*Sqrt[7 + 5*x]*((30*Sqrt[6 - 9*x]*(34864 + 44765*x))/(7 + 5*x)^2 - (2*(80577*Sqrt[682]*(-2 + 3*x)*(7 + 5*x)*Sqrt[(-5 - 18*x + 8*x^2)/(2 - 3*x)^2]*EllipticE[ArcSin[Sqrt[31/39]*Sqrt[(-5 + 2*x)/(-2 + 3*x)]], 39/62] - 37053*Sqrt[682]*(-2 + 3*x)*(7 + 5*x)*Sqrt[(-5 - 18*x + 8*x^2)/(2 - 3*x)^2]*EllipticF[ArcSin[Sqrt[31/39]*Sqrt[(-5 + 2*x)/(-2 + 3*x)]], 39/62] + Sqrt[(7 + 5*x)/(-2 + 3*x)]*(-241731*(-35 - 151*x - 34*x^2 + 40*x^3) + 48438*Sqrt[682]*(2 - 3*x)^2*Sqrt[(1 + 4*x)/(-2 + 3*x)]*Sqrt[(-35 - 11*x + 10*x^2)/(2 - 3*x)^2]*EllipticPi[117/62, ArcSin[Sqrt[31/39]*Sqrt[(-5 + 2*x)/(-2 + 3*x)]], 39/62]))/(Sqrt[3]*(2 - 3*x)^(3/2)*((7 + 5*x)/(-2 + 3*x))^(3/2)*(5 + 18*x - 8*x^2)))/(6256575*Sqrt[3])

Maple [B] time = 0.04, size = 1149, normalized size = 2.9

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] int((2-3*x)^(1/2)*(2*x-5)^(1/2)*(4*x+1)^(1/2)/(7+5*x)^(5/2), x)

[Out] -2/114703875*(39393200*11^(1/2)*((7+5*x)/(4*x+1))^(1/2)*3^(1/2)*13^(1/2)*((2*x-5)/(4*x+1))^(1/2)*((-2+3*x)/(4*x+1))^(1/2)*EllipticE(1/31*31^(1/2)*11^(1/2)*((7+5*x)/(4*x+1))^(1/2), 1/39*31^(1/2)*78^(1/2))*x^3-23614560*11^(1/2)*((7+5*x)/(4*x+1))^(1/2)*3^(1/2)*13^(1/2)*((2*x-5)/(4*x+1))^(1/2)*((-2+3*x)/(4*x+1))^(1/2)*EllipticPi(1/31*31^(1/2)*11^(1/2)*((7+5*x)/(4*x+1))^(1/2), 124/55, 1/39*31^(1/2)*78^(1/2))*x^3-24389200*11^(1/2)*((7+5*x)/(4*x+1))^(1/2)*3^(1/2)*13^(1/2)*((2*x-5)/(4*x+1))^(1/2)*((-2+3*x)/(4*x+1))^(1/2)*EllipticF(1/31*31^(1/2)*11^(1/2)*((7+5*x)/(4*x+1))^(1/2), 1/39*31^(1/2)*78^(1/2))*x^3+74847080*11^(1/2)*((7+5*x)/(4*x+1))^(1/2)*3^(1/2)*13^(1/2)*((2*x-5)/(4*x+1))^(1/2)*((-2+3*x)/(4*x+1))^(1/2)*x^2*EllipticE(1/31*31^(1/2)*11^(1/2)*((7+5*x)/(4*x+1))^(1/2), 1/39*31^(1/2)*78^(1/2))-44867664*11^(1/2)*((7+5*x)/(4*x+1))^(1/2)*3^(1/2)*13^(1/2)*((2*x-5)/(4*x+1))^(1/2)*((-2+3*x)/(4*x+1))^(1/2)*x^2*EllipticPi(1/31*31^(1/2)*11^(1/2)*((7+5*x)/(4*x+1))^(1/2), 124/55, 1/39*31^(1/2)*78^(1/2))-46339480*11^(1/2)*((7+5*x)/(4*x+1))^(1/2)*3^(1/2)*13^(1/2)*((2*x-5)/(4*x+1))^(1/2)*((-2+3*x)/(4*x+1))^(1/2)*x^2*EllipticF(1/31*31^(1/2)*11^(1/2)*((7+5*x)/(4*x+1))^(1/2), 1/39*31^(1/2)*78^(1/2))+30037315*11^(1/2)*((7+5*x)/(4*x+1))^(1/2)*3^(1/2)*13^(1/2)*((2*x-5)/(4*x+1))^(1/2)*((-2+3*x)/(4*x+1))^(1/2)*x*EllipticE(1/31*31^(1/2)*11^(1/2)*((7+5*x)/(4*x+1))^(1/2), 1/39*31^(1/2)*78^(1/2))-18006102*11^(1/2)*((7+5*x)/(4*x+1))^(1/2)*3^(1/2)*13^(1/2)*((2*x-5)/(4*x+1))^(1/2)*((-2+3*x)/(4*x+1))^(1/2)*x*EllipticPi(1/31*31^(1/2)*11^(1/2)*((7+5*x)/(4*x+1))^(1/2), 124/55, 1/39*31^(1/2)*78^(1/2))

$$\begin{aligned}
 &)) - 18596765 \cdot 11^{1/2} \cdot ((7+5x)/(4x+1))^{1/2} \cdot 3^{1/2} \cdot 13^{1/2} \cdot ((2x-5)/(4x+1))^{1/2} \cdot ((-2+3x)/(4x+1))^{1/2} \cdot x \cdot \text{EllipticF}(1/31 \cdot 31^{1/2} \cdot 11^{1/2} \cdot ((7+5x)/(4x+1))^{1/2}, 1/39 \cdot 31^{1/2} \cdot 78^{1/2}) + 3446905 \cdot 11^{1/2} \cdot ((7+5x)/(4x+1))^{1/2} \cdot 3^{1/2} \cdot 13^{1/2} \cdot ((2x-5)/(4x+1))^{1/2} \cdot ((-2+3x)/(4x+1))^{1/2} \\
 &\cdot \text{EllipticE}(1/31 \cdot 31^{1/2} \cdot 11^{1/2} \cdot ((7+5x)/(4x+1))^{1/2}, 1/39 \cdot 31^{1/2} \cdot 78^{1/2}) - 2066274 \cdot 11^{1/2} \cdot ((7+5x)/(4x+1))^{1/2} \cdot 3^{1/2} \cdot 13^{1/2} \cdot ((2x-5)/(4x+1))^{1/2} \cdot ((-2+3x)/(4x+1))^{1/2} \cdot \text{EllipticPi}(1/31 \cdot 31^{1/2} \cdot 11^{1/2} \cdot ((7+5x)/(4x+1))^{1/2}, 124/55, 1/39 \cdot 31^{1/2} \cdot 78^{1/2}) - 2134055 \cdot 11^{1/2} \cdot ((7+5x)/(4x+1))^{1/2} \cdot 3^{1/2} \cdot 13^{1/2} \cdot ((2x-5)/(4x+1))^{1/2} \cdot ((-2+3x)/(4x+1))^{1/2} \\
 &\cdot \text{EllipticF}(1/31 \cdot 31^{1/2} \cdot 11^{1/2} \cdot ((7+5x)/(4x+1))^{1/2}, 1/39 \cdot 31^{1/2} \cdot 78^{1/2}) + 523292550 \cdot x^3 - 1135538635 \cdot x^2 - 779434810 \cdot x + 869257400 \cdot (4x+1)^{1/2} \cdot (2x-5)^{1/2} \cdot (2-3x)^{1/2} / (120x^4 - 182x^3 - 385x^2 + 197x + 70) / (7+5x)^{1/2}
 \end{aligned}$$

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2}}{(5x+7)^{\frac{5}{2}}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2-3*x)^(1/2)*(-5+2*x)^(1/2)*(1+4*x)^(1/2)/(7+5*x)^(5/2),x, algorithm="maxima")

[Out] integrate(sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)/(5*x + 7)^(5/2), x)

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{5x+7}\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2}}{125x^3 + 525x^2 + 735x + 343}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2-3*x)^(1/2)*(-5+2*x)^(1/2)*(1+4*x)^(1/2)/(7+5*x)^(5/2),x, algorithm="fricas")

[Out] integral(sqrt(5*x + 7)*sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)/(125*x^3 + 525*x^2 + 735*x + 343), x)

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2-3*x)**(1/2)*(-5+2*x)**(1/2)*(1+4*x)**(1/2)/(7+5*x)**(5/2), x)

[Out] Timed out

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2}}{(5x+7)^{\frac{5}{2}}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2-3*x)^(1/2)*(-5+2*x)^(1/2)*(1+4*x)^(1/2)/(7+5*x)^(5/2), x, algorithm="giac")

[Out] integrate(sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)/(5*x + 7)^(5/2), x)

$$3.83 \quad \int \frac{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{(7+5x)^{7/2}} dx$$

Optimal. Leaf size=330

$$\frac{48884\sqrt{\frac{11}{23}}\sqrt{5x+7}\text{EllipticF}\left(\tan^{-1}\left(\frac{\sqrt{4x+1}}{\sqrt{2}\sqrt{2-3x}}\right), -\frac{39}{23}\right)}{9593415\sqrt{2x-5}\sqrt{\frac{5x+7}{5-2x}}} - \frac{2852696\sqrt{2-3x}\sqrt{4x+1}\sqrt{5x+7}}{11598438735\sqrt{2x-5}} + \frac{1426348\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}}{2319687747\sqrt{5x+7}}$$

[Out] $(-2\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x})/(25(7+5x)^{5/2}) + (17906\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x})/(2085525(7+5x)^{3/2}) + (1426348\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x})/(2319687747\sqrt{7+5x}) - (2852696\sqrt{2-3x}\sqrt{1+4x}\sqrt{7+5x})/(11598438735\sqrt{-5+2x}) + (1426348\sqrt{11/39}\sqrt{2-3x}\sqrt{(7+5x)/(5-2x)})\text{EllipticE}[\text{ArcSin}[(\sqrt{39/23}\sqrt{1+4x})/\sqrt{-5+2x}], -23/39]/(297395865\sqrt{(2-3x)/(5-2x)}\sqrt{7+5x}) - (48884\sqrt{11/23}\sqrt{7+5x})\text{EllipticF}[\text{ArcTan}[\sqrt{1+4x}/(\sqrt{2}\sqrt{2-3x})], -39/23]/(9593415\sqrt{-5+2x}\sqrt{(7+5x)/(5-2x)})$

Rubi [A] time = 0.394505, antiderivative size = 330, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 9, integrand size = 37, $\frac{\text{number of rules}}{\text{integrand size}} = 0.243$, Rules used = {160, 1604, 1599, 1602, 12, 170, 418, 176, 424}

$$-\frac{2852696\sqrt{2-3x}\sqrt{4x+1}\sqrt{5x+7}}{11598438735\sqrt{2x-5}} + \frac{1426348\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}}{2319687747\sqrt{5x+7}} + \frac{17906\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}}{2085525(5x+7)^{3/2}} - \frac{2\sqrt{2-3x}}{25}$$

Antiderivative was successfully verified.

[In] $\text{Int}[(\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x})/(7+5x)^{7/2}, x]$

[Out] $(-2\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x})/(25(7+5x)^{5/2}) + (17906\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x})/(2085525(7+5x)^{3/2}) + (1426348\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x})/(2319687747\sqrt{7+5x}) - (2852696\sqrt{2-3x}\sqrt{1+4x}\sqrt{7+5x})/(11598438735\sqrt{-5+2x}) + (1426348\sqrt{11/39}\sqrt{2-3x}\sqrt{(7+5x)/(5-2x)})\text{EllipticE}[\text{ArcSin}[(\sqrt{39/23}\sqrt{1+4x})/\sqrt{-5+2x}], -23/39]/(297395865\sqrt{(2-3x)/(5-2x)}\sqrt{7+5x}) - (48884\sqrt{11/23}\sqrt{7+5x})\text{EllipticF}[\text{ArcTan}[\sqrt{1+4x}/(\sqrt{2}\sqrt{2-3x})], -39/23]/(9593415\sqrt{-5+2x}\sqrt{(7+5x)/(5-2x)})$

(9593415*Sqrt[-5 + 2*x]*Sqrt[(7 + 5*x)/(5 - 2*x)])

Rule 160

Int[((a_.) + (b_.)*(x_))^(m_)*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)], x_Symbol] := Simp[((a + b*x)^(m + 1)*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(b*(m + 1)), x] - Dist[1/(2*b*(m + 1)), Int[((a + b*x)^(m + 1)*Simp[d*e*g + c*f*g + c*e*h + 2*(d*f*g + d*e*h + c*f*h)*x + 3*d*f*h*x^2, x])/(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]), x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m}, x] && IntegerQ[2*m] && LtQ[m, -1]

Rule 1604

Int[(((a_.) + (b_.)*(x_))^(m_)*((A_.) + (B_.)*(x_) + (C_.)*(x_)^2))/(Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Simp[((A*b^2 - a*b*B + a^2*C)*(a + b*x)^(m + 1)*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/((m + 1)*(b*c - a*d)*(b*e - a*f)*(b*g - a*h)), x] - Dist[1/(2*(m + 1)*(b*c - a*d)*(b*e - a*f)*(b*g - a*h)), Int[((a + b*x)^(m + 1)/(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]))*Simp[A*(2*a^2*d*f*h*(m + 1) - 2*a*b*(m + 1)*(d*f*g + d*e*h + c*f*h) + b^2*(2*m + 3)*(d*e*g + c*f*g + c*e*h)) - (b*B - a*C)*(a*(d*e*g + c*f*g + c*e*h) + 2*b*c*e*g*(m + 1)) - 2*((A*b - a*B)*(a*d*f*h*(m + 1) - b*(m + 2)*(d*f*g + d*e*h + c*f*h)) - C*(a^2*(d*f*g + d*e*h + c*f*h) - b^2*c*e*g*(m + 1) + a*b*(m + 1)*(d*e*g + c*f*g + c*e*h)))*x + d*f*h*(2*m + 5)*(A*b^2 - a*b*B + a^2*C)*x^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, g, h, A, B, C}, x] && IntegerQ[2*m] && LtQ[m, -1]

Rule 1599

Int[(((a_.) + (b_.)*(x_))^(m_)*((A_.) + (B_.)*(x_)))/(Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Simp[((A*b^2 - a*b*B)*(a + b*x)^(m + 1)*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/((m + 1)*(b*c - a*d)*(b*e - a*f)*(b*g - a*h)), x] - Dist[1/(2*(m + 1)*(b*c - a*d)*(b*e - a*f)*(b*g - a*h)), Int[((a + b*x)^(m + 1)/(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]))*Simp[A*(2*a^2*d*f*h*(m + 1) - 2*a*b*(m + 1)*(d*f*g + d*e*h + c*f*h) + b^2*(2*m + 3)*(d*e*g + c*f*g + c*e*h)) - b*B*(a*(d*e*g + c*f*g + c*e*h) + 2*b*c*e*g*(m + 1)) - 2*((A*b - a*B)*(a*d*f*h*(m + 1) - b*(m + 2)*(d*f*g + d*e*h + c*f*h)))*x + d*f*h*(2*m + 5)*(A*b^2 - a*b*B)*x^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, g, h, A, B}, x] && IntegerQ[2*m] && LtQ[m, -1]

Rule 1602

Int[((A_.) + (B_.)*(x_) + (C_.)*(x_)^2)/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Simp[(C*Sqrt[a + b*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(b*f*h*Sqrt[c + d

```
x]), x] + (Dist[1/(2*b*d*f*h), Int[(1*Simp[2*A*b*d*f*h - C*(b*d*e*g + a*c*f
*h) + (2*b*B*d*f*h - C*(a*d*f*h + b*(d*f*g + d*e*h + c*f*h)))*x, x]]/(Sqrt[
a + b*x]*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]), x], x] + Dist[(C*(d*e
- c*f)*(d*g - c*h))/(2*b*d*f*h), Int[Sqrt[a + b*x]/((c + d*x)^(3/2)*Sqrt[e
+ f*x]*Sqrt[g + h*x]), x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, A, B, C},
x]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_)] /; FreeQ[b, x]
```

Rule 170

```
Int[1/(Sqrt[(a_.) + (b_.)*(x_.)]*Sqrt[(c_.) + (d_.)*(x_.)]*Sqrt[(e_.) + (f_.)
*(x_.)]*Sqrt[(g_.) + (h_.)*(x_.)]), x_Symbol] := Dist[(2*Sqrt[g + h*x]*Sqrt[(
(b*e - a*f)*(c + d*x))/((d*e - c*f)*(a + b*x))])/((f*g - e*h)*Sqrt[c + d*x]
*Sqrt[-((b*e - a*f)*(g + h*x))/((f*g - e*h)*(a + b*x))]), Subst[Int[1/(Sq
rt[1 + ((b*c - a*d)*x^2)/(d*e - c*f)]*Sqrt[1 - ((b*g - a*h)*x^2)/(f*g - e*h
)]), x], x, Sqrt[e + f*x]/Sqrt[a + b*x]], x] /; FreeQ[{a, b, c, d, e, f, g,
h}, x]
```

Rule 418

```
Int[1/(Sqrt[(a_) + (b_.)*(x_)^2]*Sqrt[(c_) + (d_.)*(x_)^2]), x_Symbol] := S
imp[(Sqrt[a + b*x^2]*EllipticF[ArcTan[Rt[d/c, 2]*x], 1 - (b*c)/(a*d)]/(a*R
t[d/c, 2]*Sqrt[c + d*x^2]*Sqrt[(c*(a + b*x^2))/(a*(c + d*x^2))]), x] /; Fre
eQ[{a, b, c, d}, x] && PosQ[d/c] && PosQ[b/a] && !SimplerSqrtQ[b/a, d/c]
```

Rule 176

```
Int[Sqrt[(c_.) + (d_.)*(x_.)]/(((a_.) + (b_.)*(x_.))^(3/2)*Sqrt[(e_.) + (f_.)
*(x_.)]*Sqrt[(g_.) + (h_.)*(x_.)]), x_Symbol] := Dist[(-2*Sqrt[c + d*x]*Sqrt[
-((b*e - a*f)*(g + h*x))/((f*g - e*h)*(a + b*x))])/((b*e - a*f)*Sqrt[g +
h*x]*Sqrt[(b*e - a*f)*(c + d*x)/((d*e - c*f)*(a + b*x))]), Subst[Int[Sqrt
[1 + ((b*c - a*d)*x^2)/(d*e - c*f)]/Sqrt[1 - ((b*g - a*h)*x^2)/(f*g - e*h)
], x], x, Sqrt[e + f*x]/Sqrt[a + b*x]], x] /; FreeQ[{a, b, c, d, e, f, g, h}
, x]
```

Rule 424

```
Int[Sqrt[(a_) + (b_.)*(x_)^2]/Sqrt[(c_) + (d_.)*(x_)^2], x_Symbol] := Simp[
(Sqrt[a]*EllipticE[ArcSin[Rt[-(d/c), 2]*x], (b*c)/(a*d)]/(Sqrt[c]*Rt[-(d/c
), 2]), x] /; FreeQ[{a, b, c, d}, x] && NegQ[d/c] && GtQ[c, 0] && GtQ[a, 0]
```

Rubi steps

$$\begin{aligned}
\int \frac{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{(7+5x)^{7/2}} dx &= -\frac{2\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{25(7+5x)^{5/2}} + \frac{1}{25} \int \frac{-21+140x-72x^2}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^{5/2}} dx \\
&= -\frac{2\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{25(7+5x)^{5/2}} + \frac{17906\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{2085525(7+5x)^{3/2}} + \frac{\int \frac{-254100+3x}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}} dx}{20855} \\
&= -\frac{2\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{25(7+5x)^{5/2}} + \frac{17906\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{2085525(7+5x)^{3/2}} + \frac{1426348\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{23196877} \\
&= -\frac{2\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{25(7+5x)^{5/2}} + \frac{17906\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{2085525(7+5x)^{3/2}} + \frac{1426348\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{23196877} \\
&= -\frac{2\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{25(7+5x)^{5/2}} + \frac{17906\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{2085525(7+5x)^{3/2}} + \frac{1426348\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{23196877} \\
&= -\frac{2\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{25(7+5x)^{5/2}} + \frac{17906\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{2085525(7+5x)^{3/2}} + \frac{1426348\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{23196877} \\
&= -\frac{2\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{25(7+5x)^{5/2}} + \frac{17906\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{2085525(7+5x)^{3/2}} + \frac{1426348\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{23196877}
\end{aligned}$$

Mathematica [A] time = 2.25788, size = 251, normalized size = 0.76

$$\frac{2\sqrt{2x-5}\sqrt{4x+1} \left(-236555\sqrt{682}(3x-2)\sqrt{\frac{8x^2-18x-5}{(2-3x)^2}}(5x+7)^3 \text{EllipticF} \left(\sin^{-1} \left(\sqrt{\frac{31}{39}} \sqrt{\frac{2x-5}{3x-2}} \right), \frac{39}{62} \right) + 31\sqrt{\frac{5x+7}{3x-2}} (5010538 \right)}{11598438735\sqrt{2-3x}}$$

Antiderivative was successfully verified.

[In] Integrate[(Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/(7 + 5*x)^(7/2), x]

[Out] (-2*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(31*Sqrt[(7 + 5*x)/(-2 + 3*x)]*(137502130 + 880765228*x + 1137407943*x^2 - 729949210*x^3 + 50105384*x^4) + 713174*Sqr

```
t[682]*(-2 + 3*x)*(7 + 5*x)^3*Sqrt[(-5 - 18*x + 8*x^2)/(2 - 3*x)^2]*EllipticE[ArcSin[Sqrt[31/39]*Sqrt[(-5 + 2*x)/(-2 + 3*x)]], 39/62] - 236555*Sqrt[682]*(-2 + 3*x)*(7 + 5*x)^3*Sqrt[(-5 - 18*x + 8*x^2)/(2 - 3*x)^2]*EllipticF[ArcSin[Sqrt[31/39]*Sqrt[(-5 + 2*x)/(-2 + 3*x)]], 39/62)]/(11598438735*Sqrt[2 - 3*x]*(7 + 5*x)^(5/2)*Sqrt[(7 + 5*x)/(-2 + 3*x)]*(-5 - 18*x + 8*x^2))
```

Maple [B] time = 0.042, size = 973, normalized size = 3.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((2-3*x)^(1/2)*(2*x-5)^(1/2)*(4*x+1)^(1/2)/(7+5*x)^(7/2), x)
```

```
[Out] -2/11598438735*(285269600*11^(1/2)*((7+5*x)/(4*x+1))^(1/2)*3^(1/2)*13^(1/2)*((2*x-5)/(4*x+1))^(1/2)*((-2+3*x)/(4*x+1))^(1/2)*EllipticE(1/31*31^(1/2)*11^(1/2)*((7+5*x)/(4*x+1))^(1/2), 1/39*31^(1/2)*78^(1/2))*x^4+17811200*11^(1/2)*((7+5*x)/(4*x+1))^(1/2)*3^(1/2)*13^(1/2)*((2*x-5)/(4*x+1))^(1/2)*((-2+3*x)/(4*x+1))^(1/2)*EllipticF(1/31*31^(1/2)*11^(1/2)*((7+5*x)/(4*x+1))^(1/2), 1/39*31^(1/2)*78^(1/2))*x^4+941389680*11^(1/2)*((7+5*x)/(4*x+1))^(1/2)*3^(1/2)*13^(1/2)*((2*x-5)/(4*x+1))^(1/2)*((-2+3*x)/(4*x+1))^(1/2)*EllipticE(1/31*31^(1/2)*11^(1/2)*((7+5*x)/(4*x+1))^(1/2), 1/39*31^(1/2)*78^(1/2))*x^3+58776960*11^(1/2)*((7+5*x)/(4*x+1))^(1/2)*3^(1/2)*13^(1/2)*((2*x-5)/(4*x+1))^(1/2)*((-2+3*x)/(4*x+1))^(1/2)*EllipticF(1/31*31^(1/2)*11^(1/2)*((7+5*x)/(4*x+1))^(1/2), 1/39*31^(1/2)*78^(1/2))*x^3+976335206*11^(1/2)*((7+5*x)/(4*x+1))^(1/2)*3^(1/2)*13^(1/2)*((2*x-5)/(4*x+1))^(1/2)*((-2+3*x)/(4*x+1))^(1/2)*x^2*EllipticE(1/31*31^(1/2)*11^(1/2)*((7+5*x)/(4*x+1))^(1/2), 1/39*31^(1/2)*78^(1/2))+60958832*11^(1/2)*((7+5*x)/(4*x+1))^(1/2)*3^(1/2)*13^(1/2)*((2*x-5)/(4*x+1))^(1/2)*((-2+3*x)/(4*x+1))^(1/2)*x^2*EllipticF(1/31*31^(1/2)*11^(1/2)*((7+5*x)/(4*x+1))^(1/2), 1/39*31^(1/2)*78^(1/2))+329486388*11^(1/2)*((7+5*x)/(4*x+1))^(1/2)*3^(1/2)*13^(1/2)*((2*x-5)/(4*x+1))^(1/2)*((-2+3*x)/(4*x+1))^(1/2)*x*EllipticE(1/31*31^(1/2)*11^(1/2)*((7+5*x)/(4*x+1))^(1/2), 1/39*31^(1/2)*78^(1/2))+20571936*11^(1/2)*((7+5*x)/(4*x+1))^(1/2)*3^(1/2)*13^(1/2)*((2*x-5)/(4*x+1))^(1/2)*((-2+3*x)/(4*x+1))^(1/2)*x*EllipticF(1/31*31^(1/2)*11^(1/2)*((7+5*x)/(4*x+1))^(1/2), 1/39*31^(1/2)*78^(1/2))+34945526*11^(1/2)*((7+5*x)/(4*x+1))^(1/2)*3^(1/2)*13^(1/2)*((2*x-5)/(4*x+1))^(1/2)*((-2+3*x)/(4*x+1))^(1/2)*EllipticE(1/31*31^(1/2)*11^(1/2)*((7+5*x)/(4*x+1))^(1/2), 1/39*31^(1/2)*78^(1/2))+2181872*11^(1/2)*((7+5*x)/(4*x+1))^(1/2)*3^(1/2)*13^(1/2)*((2*x-5)/(4*x+1))^(1/2)*((-2+3*x)/(4*x+1))^(1/2)*EllipticF(1/31*31^(1/2)*11^(1/2)*((7+5*x)/(4*x+1))^(1/2), 1/39*31^(1/2)*78^(1/2))-351449540*x^4+19294337060*x^3-26198770563*x^2-3855274122*x+9191461480)*(4*x+1)^(1/2)*(2*x-5)^(1/2)*(2-3*x)^(1/2)/(120*x^4-182*x^3-385*x^2+197*x+70)/(7+5*x)^(3/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2}}{(5x+7)^{\frac{7}{2}}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2-3*x)^(1/2)*(-5+2*x)^(1/2)*(1+4*x)^(1/2)/(7+5*x)^(7/2),x, algorith="maxima")

[Out] integrate(sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)/(5*x + 7)^(7/2), x)

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{5x+7}\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2}}{625x^4 + 3500x^3 + 7350x^2 + 6860x + 2401}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2-3*x)^(1/2)*(-5+2*x)^(1/2)*(1+4*x)^(1/2)/(7+5*x)^(7/2),x, algorith="fricas")

[Out] integral(sqrt(5*x + 7)*sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)/(625*x^4 + 3500*x^3 + 7350*x^2 + 6860*x + 2401), x)

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2-3*x)**(1/2)*(-5+2*x)**(1/2)*(1+4*x)**(1/2)/(7+5*x)**(7/2),x)

[Out] Timed out

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2}}{(5x+7)^{\frac{7}{2}}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((2-3*x)^(1/2)*(-5+2*x)^(1/2)*(1+4*x)^(1/2)/(7+5*x)^(7/2),x, algo  
ithm="giac")
```

```
[Out] integrate(sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)/(5*x + 7)^(7/2), x)
```

$$3.84 \quad \int \frac{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{(7+5x)^{9/2}} dx$$

Optimal. Leaf size=370

$$\frac{1212290288\sqrt{\frac{11}{23}}\sqrt{5x+7}\text{EllipticF}\left(\tan^{-1}\left(\frac{\sqrt{4x+1}}{\sqrt{2}\sqrt{2-3x}}\right), -\frac{39}{23}\right)}{1867348636335\sqrt{2x-5}\sqrt{\frac{5x+7}{5-2x}}} - \frac{65687975672\sqrt{2-3x}\sqrt{4x+1}\sqrt{5x+7}}{2257624501329015\sqrt{2x-5}} + \frac{32843987836\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}}{451524900265803\sqrt{5x+7}}$$

```
[Out] (-2*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/(35*(7 + 5*x)^(7/2)) + (255
8*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/(695175*(7 + 5*x)^(5/2)) + (2
3758016*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/(57992193675*(7 + 5*x)^(
3/2)) + (32843987836*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/(45152490
0265803*Sqrt[7 + 5*x]) - (65687975672*Sqrt[2 - 3*x]*Sqrt[1 + 4*x]*Sqrt[7 +
5*x])/(2257624501329015*Sqrt[-5 + 2*x]) + (32843987836*Sqrt[11/39]*Sqrt[2 -
3*x]*Sqrt[(7 + 5*x)/(5 - 2*x)]*EllipticE[ArcSin[(Sqrt[39/23]*Sqrt[1 + 4*x]
)/Sqrt[-5 + 2*x]], -23/39])/(57887807726385*Sqrt[(2 - 3*x)/(5 - 2*x)]*Sqrt[
7 + 5*x]) - (1212290288*Sqrt[11/23]*Sqrt[7 + 5*x]*EllipticF[ArcTan[Sqrt[1 +
4*x]/(Sqrt[2]*Sqrt[2 - 3*x])], -39/23])/(1867348636335*Sqrt[-5 + 2*x]*Sqrt
[(7 + 5*x)/(5 - 2*x)])
```

Rubi [A] time = 0.51458, antiderivative size = 370, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 9, integrand size = 37, $\frac{\text{number of rules}}{\text{integrand size}} = 0.243$, Rules used = {160, 1604, 1599, 1602, 12, 170, 418, 176, 424}

$$\frac{65687975672\sqrt{2-3x}\sqrt{4x+1}\sqrt{5x+7}}{2257624501329015\sqrt{2x-5}} + \frac{32843987836\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}}{451524900265803\sqrt{5x+7}} + \frac{23758016\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}}{57992193675(5x+7)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/(7 + 5*x)^(9/2), x]
```

```
[Out] (-2*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/(35*(7 + 5*x)^(7/2)) + (255
8*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/(695175*(7 + 5*x)^(5/2)) + (2
3758016*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/(57992193675*(7 + 5*x)^(
3/2)) + (32843987836*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/(45152490
0265803*Sqrt[7 + 5*x]) - (65687975672*Sqrt[2 - 3*x]*Sqrt[1 + 4*x]*Sqrt[7 +
5*x])/(2257624501329015*Sqrt[-5 + 2*x]) + (32843987836*Sqrt[11/39]*Sqrt[2 -
3*x]*Sqrt[(7 + 5*x)/(5 - 2*x)]*EllipticE[ArcSin[(Sqrt[39/23]*Sqrt[1 + 4*x]
)/Sqrt[-5 + 2*x]], -23/39])/(57887807726385*Sqrt[(2 - 3*x)/(5 - 2*x)]*Sqrt[
7 + 5*x]) - (1212290288*Sqrt[11/23]*Sqrt[7 + 5*x]*EllipticF[ArcTan[Sqrt[1 +
4*x]/(Sqrt[2]*Sqrt[2 - 3*x])], -39/23])/(1867348636335*Sqrt[-5 + 2*x]*Sqrt
[(7 + 5*x)/(5 - 2*x)])
```



```
)/Sqrt[-5 + 2*x]], -23/39]]/(57887807726385*Sqrt[(2 - 3*x)/(5 - 2*x)]*Sqrt[
7 + 5*x]) - (1212290288*Sqrt[11/23]*Sqrt[7 + 5*x]*EllipticF[ArcTan[Sqrt[1 +
4*x]/(Sqrt[2]*Sqrt[2 - 3*x])], -39/23]]/(1867348636335*Sqrt[-5 + 2*x]*Sqrt
[(7 + 5*x)/(5 - 2*x)])
```

Rule 160

```
Int[((a_.) + (b_.)*(x_))^(m_)*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(
x_)]*Sqrt[(g_.) + (h_.)*(x_)], x_Symbol] :> Simp[((a + b*x)^(m + 1)*Sqrt[c
+ d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(b*(m + 1)), x] - Dist[1/(2*b*(m + 1)),
Int[((a + b*x)^(m + 1)*Simp[d*e*g + c*f*g + c*e*h + 2*(d*f*g + d*e*h + c*f
*h)*x + 3*d*f*h*x^2, x])/(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]), x], x
] /; FreeQ[{a, b, c, d, e, f, g, h, m}, x] && IntegerQ[2*m] && LtQ[m, -1]
```

Rule 1604

```
Int((((a_.) + (b_.)*(x_))^(m_)*((A_.) + (B_.)*(x_) + (C_.)*(x_)^2))/(Sqrt[(
c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)], x_Sy
mbol] :> Simp[((A*b^2 - a*b*B + a^2*C)*(a + b*x)^(m + 1)*Sqrt[c + d*x]*Sqrt
[e + f*x]*Sqrt[g + h*x])/(m + 1)*(b*c - a*d)*(b*e - a*f)*(b*g - a*h)), x]
- Dist[1/(2*(m + 1)*(b*c - a*d)*(b*e - a*f)*(b*g - a*h)), Int[((a + b*x)^(m
+ 1)/(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]))*Simp[A*(2*a^2*d*f*h*(m +
1) - 2*a*b*(m + 1)*(d*f*g + d*e*h + c*f*h) + b^2*(2*m + 3)*(d*e*g + c*f*g
+ c*e*h)) - (b*B - a*C)*(a*(d*e*g + c*f*g + c*e*h) + 2*b*c*e*g*(m + 1)) - 2
*((A*b - a*B)*(a*d*f*h*(m + 1) - b*(m + 2)*(d*f*g + d*e*h + c*f*h)) - C*(a^
2*(d*f*g + d*e*h + c*f*h) - b^2*c*e*g*(m + 1) + a*b*(m + 1)*(d*e*g + c*f*g
+ c*e*h)))*x + d*f*h*(2*m + 5)*(A*b^2 - a*b*B + a^2*C)*x^2, x], x], x] /; F
reeQ[{a, b, c, d, e, f, g, h, A, B, C}, x] && IntegerQ[2*m] && LtQ[m, -1]
```

Rule 1599

```
Int((((a_.) + (b_.)*(x_))^(m_)*((A_.) + (B_.)*(x_)))/(Sqrt[(c_.) + (d_.)*(x
_)]*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)], x_Symbol] :> Simp[(
(A*b^2 - a*b*B)*(a + b*x)^(m + 1)*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]
)/(m + 1)*(b*c - a*d)*(b*e - a*f)*(b*g - a*h)), x] - Dist[1/(2*(m + 1)*(b*
c - a*d)*(b*e - a*f)*(b*g - a*h)), Int[((a + b*x)^(m + 1)/(Sqrt[c + d*x]*Sq
rt[e + f*x]*Sqrt[g + h*x]))*Simp[A*(2*a^2*d*f*h*(m + 1) - 2*a*b*(m + 1)*(d*
f*g + d*e*h + c*f*h) + b^2*(2*m + 3)*(d*e*g + c*f*g + c*e*h)) - b*B*(a*(d*e
*g + c*f*g + c*e*h) + 2*b*c*e*g*(m + 1)) - 2*((A*b - a*B)*(a*d*f*h*(m + 1)
- b*(m + 2)*(d*f*g + d*e*h + c*f*h)))*x + d*f*h*(2*m + 5)*(A*b^2 - a*b*B)*x
^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, g, h, A, B}, x] && IntegerQ[2*m]
&& LtQ[m, -1]
```

Rule 1602

```

Int[((A_.) + (B_.)*(x_) + (C_.)*(x_)^2)/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol]
:> Simp[(C*Sqrt[a + b*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(b*f*h*Sqrt[c + d*x]), x] + (Dist[1/(2*b*d*f*h), Int[(1*Simp[2*A*b*d*f*h - C*(b*d*e*g + a*c*f*h) + (2*b*B*d*f*h - C*(a*d*f*h + b*(d*f*g + d*e*h + c*f*h)))*x, x])/(Sqrt[a + b*x]*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]), x], x] + Dist[(C*(d*e - c*f)*(d*g - c*h))/(2*b*d*f*h), Int[Sqrt[a + b*x]/((c + d*x)^(3/2)*Sqrt[e + f*x]*Sqrt[g + h*x]), x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, A, B, C}, x]

```

Rule 12

```

Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b_)*(v_) /; FreeQ[b, x]]

```

Rule 170

```

Int[1/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] :> Dist[(2*Sqrt[g + h*x]*Sqrt[(b*e - a*f)*(c + d*x)]/((d*e - c*f)*(a + b*x)))/((f*g - e*h)*Sqrt[c + d*x]*Sqrt[-((b*e - a*f)*(g + h*x))/((f*g - e*h)*(a + b*x))]), Subst[Int[1/(Sqrt[1 + ((b*c - a*d)*x^2)/(d*e - c*f)]*Sqrt[1 - ((b*g - a*h)*x^2)/(f*g - e*h)]), x], x, Sqrt[e + f*x]/Sqrt[a + b*x]], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x]

```

Rule 418

```

Int[1/(Sqrt[(a_) + (b_.)*(x_)^2]*Sqrt[(c_) + (d_.)*(x_)^2]), x_Symbol] :> Simp[(Sqrt[a + b*x^2]*EllipticF[ArcTan[Rt[d/c, 2]*x], 1 - (b*c)/(a*d)]/(a*Rt[d/c, 2]*Sqrt[c + d*x^2]*Sqrt[(c*(a + b*x^2))/(a*(c + d*x^2))]), x] /; FreeQ[{a, b, c, d}, x] && PosQ[d/c] && PosQ[b/a] && !SimplerSqrtQ[b/a, d/c]

```

Rule 176

```

Int[Sqrt[(c_.) + (d_.)*(x_)]/(((a_.) + (b_.)*(x_)^(3/2)*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] :> Dist[(-2*Sqrt[c + d*x]*Sqrt[-((b*e - a*f)*(g + h*x))/((f*g - e*h)*(a + b*x))])/((b*e - a*f)*Sqrt[g + h*x]*Sqrt[(b*e - a*f)*(c + d*x)]/((d*e - c*f)*(a + b*x))), Subst[Int[Sqrt[1 + ((b*c - a*d)*x^2)/(d*e - c*f)]/Sqrt[1 - ((b*g - a*h)*x^2)/(f*g - e*h)], x], x, Sqrt[e + f*x]/Sqrt[a + b*x]], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x]

```

Rule 424

```

Int[Sqrt[(a_) + (b_.)*(x_)^2]/Sqrt[(c_) + (d_.)*(x_)^2], x_Symbol] :> Simp[

```

(Sqrt[a]*EllipticE[ArcSin[Rt[-(d/c), 2]*x], (b*c)/(a*d)]/(Sqrt[c]*Rt[-(d/c), 2]), x] /; FreeQ[{a, b, c, d}, x] && NegQ[d/c] && GtQ[c, 0] && GtQ[a, 0]

Rubi steps

$$\begin{aligned}
 \int \frac{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{(7+5x)^{9/2}} dx &= -\frac{2\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{35(7+5x)^{7/2}} + \frac{1}{35} \int \frac{-21+140x-72x^2}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^{7/2}} dx \\
 &= -\frac{2\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{35(7+5x)^{7/2}} + \frac{2558\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{695175(7+5x)^{5/2}} + \frac{\int \frac{-548842+138213}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}} dx}{4866} \\
 &= -\frac{2\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{35(7+5x)^{7/2}} + \frac{2558\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{695175(7+5x)^{5/2}} + \frac{23758016\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{57992193} \\
 &= -\frac{2\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{35(7+5x)^{7/2}} + \frac{2558\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{695175(7+5x)^{5/2}} + \frac{23758016\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{57992193} \\
 &= -\frac{2\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{35(7+5x)^{7/2}} + \frac{2558\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{695175(7+5x)^{5/2}} + \frac{23758016\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{57992193} \\
 &= -\frac{2\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{35(7+5x)^{7/2}} + \frac{2558\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{695175(7+5x)^{5/2}} + \frac{23758016\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{57992193} \\
 &= -\frac{2\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{35(7+5x)^{7/2}} + \frac{2558\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{695175(7+5x)^{5/2}} + \frac{23758016\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{57992193} \\
 &= -\frac{2\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{35(7+5x)^{7/2}} + \frac{2558\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{695175(7+5x)^{5/2}} + \frac{23758016\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{57992193} \\
 &= -\frac{2\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{35(7+5x)^{7/2}} + \frac{2558\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{695175(7+5x)^{5/2}} + \frac{23758016\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{57992193}
 \end{aligned}$$

Mathematica [A] time = 2.59452, size = 259, normalized size = 0.7

$$2\sqrt{2x-5}\sqrt{4x+1}\sqrt{5x+7} \left(\frac{242 \left(19017205\sqrt{682}(3x-2)\sqrt{\frac{8x^2-18x-5}{(2-3x)^2}} \text{EllipticF}\left(\sin^{-1}\left(\sqrt{\frac{31}{39}}\sqrt{\frac{2x-5}{3x-2}}\right), \frac{39}{62}\right) + 203578437\sqrt{\frac{5x+7}{3x-2}}(8x^2-18x-5) - 67859479\sqrt{682}\right)}{\sqrt{\frac{5x+7}{3x-2}}(8x^2-18x-5)} \right)$$

2257624501329015

Antiderivative was successfully verified.

```
[In] Integrate[(Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/(7 + 5*x)^(9/2), x]
```

```
[Out] (2*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*Sqrt[7 + 5*x]*(-((( -2 + 3*x)*(1539551542327
0 + 1134903104422229*x + 54668919175710*x^2 + 10263746198750*x^3)))/(7 + 5*x)
^4) + (242*(203578437*Sqrt[(7 + 5*x)/(-2 + 3*x)]*(-5 - 18*x + 8*x^2) - 6785
9479*Sqrt[682]*(-2 + 3*x)*Sqrt[(-5 - 18*x + 8*x^2)/(2 - 3*x)^2]*EllipticE[A
rcSin[Sqrt[31/39]*Sqrt[(-5 + 2*x)/(-2 + 3*x)]], 39/62] + 19017205*Sqrt[682]
*(-2 + 3*x)*Sqrt[(-5 - 18*x + 8*x^2)/(2 - 3*x)^2]*EllipticF[ArcSin[Sqrt[31/
39]*Sqrt[(-5 + 2*x)/(-2 + 3*x)]], 39/62]))/(Sqrt[(7 + 5*x)/(-2 + 3*x)]*(-5
- 18*x + 8*x^2))))/(2257624501329015*Sqrt[2 - 3*x])
```

Maple [B] time = 0.044, size = 1160, normalized size = 3.1

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((2-3*x)^(1/2)*(2*x-5)^(1/2)*(4*x+1)^(1/2)/(7+5*x)^(9/2), x)
```

```
[Out] -2/2257624501329015*(4737011092000*11^(1/2)*((7+5*x)/(4*x+1))^(1/2)*3^(1/2)
*13^(1/2)*((2*x-5)/(4*x+1))^(1/2)*((-2+3*x)/(4*x+1))^(1/2)*EllipticF(1/31*3
1^(1/2)*11^(1/2)*((7+5*x)/(4*x+1))^(1/2), 1/39*31^(1/2)*78^(1/2))*x^5+328439
87836000*11^(1/2)*((7+5*x)/(4*x+1))^(1/2)*3^(1/2)*13^(1/2)*((2*x-5)/(4*x+1)
)^(1/2)*((-2+3*x)/(4*x+1))^(1/2)*EllipticE(1/31*31^(1/2)*11^(1/2)*((7+5*x)/
(4*x+1))^(1/2), 1/39*31^(1/2)*78^(1/2))*x^5+22263952132400*11^(1/2)*((7+5*x)
/(4*x+1))^(1/2)*3^(1/2)*13^(1/2)*((2*x-5)/(4*x+1))^(1/2)*((-2+3*x)/(4*x+1)
)^(1/2)*EllipticF(1/31*31^(1/2)*11^(1/2)*((7+5*x)/(4*x+1))^(1/2), 1/39*31^(1/
2)*78^(1/2))*x^4+154366742829200*11^(1/2)*((7+5*x)/(4*x+1))^(1/2)*3^(1/2)*1
3^(1/2)*((2*x-5)/(4*x+1))^(1/2)*((-2+3*x)/(4*x+1))^(1/2)*EllipticE(1/31*31^(
1/2)*11^(1/2)*((7+5*x)/(4*x+1))^(1/2), 1/39*31^(1/2)*78^(1/2))*x^4+38097411
707410*11^(1/2)*((7+5*x)/(4*x+1))^(1/2)*3^(1/2)*13^(1/2)*((2*x-5)/(4*x+1))^(
1/2)*((-2+3*x)/(4*x+1))^(1/2)*EllipticF(1/31*31^(1/2)*11^(1/2)*((7+5*x)/(4
*x+1))^(1/2), 1/39*31^(1/2)*78^(1/2))*x^3+264147772171030*11^(1/2)*((7+5*x)/
(4*x+1))^(1/2)*3^(1/2)*13^(1/2)*((2*x-5)/(4*x+1))^(1/2)*((-2+3*x)/(4*x+1))^(
1/2)*EllipticE(1/31*31^(1/2)*11^(1/2)*((7+5*x)/(4*x+1))^(1/2), 1/39*31^(1/2)
)*78^(1/2))*x^3+28168636458578*11^(1/2)*((7+5*x)/(4*x+1))^(1/2)*3^(1/2)*13^(
1/2)*((2*x-5)/(4*x+1))^(1/2)*((-2+3*x)/(4*x+1))^(1/2)*x^2*EllipticF(1/31*3
1^(1/2)*11^(1/2)*((7+5*x)/(4*x+1))^(1/2), 1/39*31^(1/2)*78^(1/2))+1953067736
66774*11^(1/2)*((7+5*x)/(4*x+1))^(1/2)*3^(1/2)*13^(1/2)*((2*x-5)/(4*x+1))^(
1/2)*((-2+3*x)/(4*x+1))^(1/2)*x^2*EllipticE(1/31*31^(1/2)*11^(1/2)*((7+5*x)
/(4*x+1))^(1/2), 1/39*31^(1/2)*78^(1/2))+8240030794534*11^(1/2)*((7+5*x)/(4*
x+1))^(1/2)*3^(1/2)*13^(1/2)*((2*x-5)/(4*x+1))^(1/2)*((-2+3*x)/(4*x+1))^(1/
```

2)*x*EllipticF(1/31*31^(1/2)*11^(1/2)*((7+5*x)/(4*x+1))^(1/2),1/39*31^(1/2)*78^(1/2))+57132116840722*11^(1/2)*((7+5*x)/(4*x+1))^(1/2)*3^(1/2)*13^(1/2)*((2*x-5)/(4*x+1))^(1/2)*((-2+3*x)/(4*x+1))^(1/2)*x*EllipticE(1/31*31^(1/2)*11^(1/2)*((7+5*x)/(4*x+1))^(1/2),1/39*31^(1/2)*78^(1/2))+812397402278*11^(1/2)*((7+5*x)/(4*x+1))^(1/2)*3^(1/2)*13^(1/2)*((2*x-5)/(4*x+1))^(1/2)*((-2+3*x)/(4*x+1))^(1/2)*EllipticF(1/31*31^(1/2)*11^(1/2)*((7+5*x)/(4*x+1))^(1/2),1/39*31^(1/2)*78^(1/2))+5632743913874*11^(1/2)*((7+5*x)/(4*x+1))^(1/2)*3^(1/2)*13^(1/2)*((2*x-5)/(4*x+1))^(1/2)*((-2+3*x)/(4*x+1))^(1/2)*EllipticE(1/31*31^(1/2)*11^(1/2)*((7+5*x)/(4*x+1))^(1/2),1/39*31^(1/2)*78^(1/2))+5810951702460*x^5-173342585590346*x^4+2153615020704860*x^3-4639703191080657*x^2+51366440607272*x+1423213141652020)*(4*x+1)^(1/2)*(2*x-5)^(1/2)*(2-3*x)^(1/2)/(120*x^4-182*x^3-385*x^2+197*x+70)/(7+5*x)^(5/2)

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2}}{(5x+7)^{\frac{9}{2}}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2-3*x)^(1/2)*(-5+2*x)^(1/2)*(1+4*x)^(1/2)/(7+5*x)^(9/2),x, algorithm="maxima")

[Out] integrate(sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)/(5*x + 7)^(9/2), x)

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{5x+7}\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2}}{3125x^5 + 21875x^4 + 61250x^3 + 85750x^2 + 60025x + 16807}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2-3*x)^(1/2)*(-5+2*x)^(1/2)*(1+4*x)^(1/2)/(7+5*x)^(9/2),x, algorithm="fricas")

[Out] integral(sqrt(5*x + 7)*sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)/(3125*x^5 + 21875*x^4 + 61250*x^3 + 85750*x^2 + 60025*x + 16807), x)

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2-3*x)**(1/2)*(-5+2*x)**(1/2)*(1+4*x)**(1/2)/(7+5*x)**(9/2), x)

[Out] Timed out

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2}}{(5x+7)^{\frac{9}{2}}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2-3*x)^(1/2)*(-5+2*x)^(1/2)*(1+4*x)^(1/2)/(7+5*x)^(9/2), x, algorithm="giac")

[Out] integrate(sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)/(5*x + 7)^(9/2), x)

$$3.85 \quad \int \frac{\sqrt{2-3x}\sqrt{1+4x}(7+5x)^{5/2}}{\sqrt{-5+2x}} dx$$

Optimal. Leaf size=429

$$\frac{861015607\sqrt{\frac{11}{23}}\sqrt{5x+7}\text{EllipticF}\left(\tan^{-1}\left(\frac{\sqrt{4x+1}}{\sqrt{2}\sqrt{2-3x}}\right), -\frac{39}{23}\right)}{331776\sqrt{2x-5}\sqrt{\frac{5x+7}{5-2x}}} + \frac{1}{8}\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}(5x+7)^{5/2} + \frac{1445}{576}\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}$$

```
[Out] (2466927*Sqrt[2 - 3*x]*Sqrt[1 + 4*x]*Sqrt[7 + 5*x])/(4096*Sqrt[-5 + 2*x]) +
(1561915*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*Sqrt[7 + 5*x])/27648 +
(1445*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(7 + 5*x)^(3/2))/576 + (S
qrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(7 + 5*x)^(5/2))/8 - (2466927*Sqr
t[429]*Sqrt[2 - 3*x]*Sqrt[(7 + 5*x)/(5 - 2*x)]*EllipticE[ArcSin[(Sqrt[39/23
]*Sqrt[1 + 4*x])/Sqrt[-5 + 2*x]], -23/39])/(8192*Sqrt[(2 - 3*x)/(5 - 2*x)]*
Sqrt[7 + 5*x]) + (861015607*Sqrt[11/23]*Sqrt[7 + 5*x]*EllipticF[ArcTan[Sqrt
[1 + 4*x]/(Sqrt[2]*Sqrt[2 - 3*x])], -39/23])/(331776*Sqrt[-5 + 2*x]*Sqrt[(7
+ 5*x)/(5 - 2*x)]) + (331574321009*(2 - 3*x)*Sqrt[(5 - 2*x)/(2 - 3*x)]*Sqr
t[-((1 + 4*x)/(2 - 3*x))]*EllipticPi[-69/55, ArcSin[(Sqrt[11/23]*Sqrt[7 + 5
*x])/Sqrt[2 - 3*x]], -23/39])/(1658880*Sqrt[429]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*
x])
```

Rubi [A] time = 0.525891, antiderivative size = 429, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 10, integrand size = 37, $\frac{\text{number of rules}}{\text{integrand size}} = 0.27$, Rules used = {162, 1600, 1602, 1598, 170, 418, 165, 537, 176, 424}

$$\frac{1}{8}\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}(5x+7)^{5/2} + \frac{1445}{576}\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}(5x+7)^{3/2} + \frac{1561915\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}\sqrt{5}}{27648}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[2 - 3*x]*Sqrt[1 + 4*x]*(7 + 5*x)^(5/2))/Sqrt[-5 + 2*x], x]
```

```
[Out] (2466927*Sqrt[2 - 3*x]*Sqrt[1 + 4*x]*Sqrt[7 + 5*x])/(4096*Sqrt[-5 + 2*x]) +
(1561915*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*Sqrt[7 + 5*x])/27648 +
(1445*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(7 + 5*x)^(3/2))/576 + (S
qrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(7 + 5*x)^(5/2))/8 - (2466927*Sqr
t[429]*Sqrt[2 - 3*x]*Sqrt[(7 + 5*x)/(5 - 2*x)]*EllipticE[ArcSin[(Sqrt[39/23
]*Sqrt[1 + 4*x])/Sqrt[-5 + 2*x]], -23/39])/(8192*Sqrt[(2 - 3*x)/(5 - 2*x)]*
```

```
Sqrt[7 + 5*x]) + (861015607*Sqrt[11/23]*Sqrt[7 + 5*x]*EllipticF[ArcTan[Sqrt
[1 + 4*x]/(Sqrt[2]*Sqrt[2 - 3*x])], -39/23])/(331776*Sqrt[-5 + 2*x]*Sqrt[(7
+ 5*x)/(5 - 2*x])) + (331574321009*(2 - 3*x)*Sqrt[(5 - 2*x)/(2 - 3*x)]*Sqr
t[-((1 + 4*x)/(2 - 3*x))]*EllipticPi[-69/55, ArcSin[(Sqrt[11/23]*Sqrt[7 + 5
*x])/Sqrt[2 - 3*x]], -23/39])/(1658880*Sqrt[429]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*
x])
```

Rule 162

```
Int[(((a_.) + (b_.)*(x_))^(m_)*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*
(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] := Simp[(2*(a + b*x)^m*Sqrt[c +
d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(d*(2*m + 3)), x] - Dist[1/(d*(2*m + 3)),
Int[((a + b*x)^(m - 1)/(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]))*Simp[2
*b*c*e*g*m + a*(c*(f*g + e*h) - 2*d*e*g*(m + 1)) - (b*(2*d*e*g - c*(f*g +
e*h)*(2*m + 1)) - a*(2*c*f*h - d*(2*m + 1)*(f*g + e*h)))*x - (2*a*d*f*h*m +
b*(d*(f*g + e*h) - 2*c*f*h*(m + 1)))*x^2, x], x] /; FreeQ[{a, b, c, d,
e, f, g, h, m}, x] && IntegerQ[2*m] && GtQ[m, 0]
```

Rule 1600

```
Int[(((a_.) + (b_.)*(x_))^(m_.)*((A_.) + (B_.)*(x_) + (C_.)*(x_)^2))/(Sqrt[
(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_S
ymbol] := Simp[(2*C*(a + b*x)^m*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/
(d*f*h*(2*m + 3)), x] + Dist[1/(d*f*h*(2*m + 3)), Int[((a + b*x)^(m - 1)/(S
qrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]))*Simp[a*A*d*f*h*(2*m + 3) - C*(a*
(d*e*g + c*f*g + c*e*h) + 2*b*c*e*g*m) + ((A*b + a*B)*d*f*h*(2*m + 3) - C*(
2*a*(d*f*g + d*e*h + c*f*h) + b*(2*m + 1)*(d*e*g + c*f*g + c*e*h)))*x + (b*
B*d*f*h*(2*m + 3) + 2*C*(a*d*f*h*m - b*(m + 1)*(d*f*g + d*e*h + c*f*h)))*x^
2, x], x] /; FreeQ[{a, b, c, d, e, f, g, h, A, B, C}, x] && IntegerQ[2*
m] && GtQ[m, 0]
```

Rule 1602

```
Int[(((A_.) + (B_.)*(x_) + (C_.)*(x_)^2)/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.
) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbo
l] := Simp[(C*Sqrt[a + b*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(b*f*h*Sqrt[c + d*
x]), x] + (Dist[1/(2*b*d*f*h), Int[(1*Simp[2*A*b*d*f*h - C*(b*d*e*g + a*c*f
*h) + (2*b*B*d*f*h - C*(a*d*f*h + b*(d*f*g + d*e*h + c*f*h)))*x, x])/(Sqrt[
a + b*x]*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]), x], x] + Dist[(C*(d*e
- c*f)*(d*g - c*h))/(2*b*d*f*h), Int[Sqrt[a + b*x]/((c + d*x)^(3/2)*Sqrt[e
+ f*x]*Sqrt[g + h*x]), x], x] /; FreeQ[{a, b, c, d, e, f, g, h, A, B, C},
x]
```

Rule 1598


```
Int[((A_.) + (B_.)*(x_))/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]
*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Dist[(A*b
- a*B)/b, Int[1/(Sqrt[a + b*x]*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]),
x], x] + Dist[B/b, Int[Sqrt[a + b*x]/(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g +
h*x]), x], x] /; FreeQ[{a, b, c, d, e, f, g, h, A, B}, x]
```

Rule 170

```
Int[1/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)
*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Dist[(2*Sqrt[g + h*x]*Sqrt[(
(b*e - a*f)*(c + d*x))/((d*e - c*f)*(a + b*x))])/((f*g - e*h)*Sqrt[c + d*x]
*Sqrt[-(((b*e - a*f)*(g + h*x))/((f*g - e*h)*(a + b*x)))]), Subst[Int[1/(Sq
rt[1 + ((b*c - a*d)*x^2)/(d*e - c*f)]*Sqrt[1 - ((b*g - a*h)*x^2)/(f*g - e*h
)]), x], x, Sqrt[e + f*x]/Sqrt[a + b*x]], x] /; FreeQ[{a, b, c, d, e, f, g,
h}, x]
```

Rule 418

```
Int[1/(Sqrt[(a_) + (b_.)*(x_)^2]*Sqrt[(c_) + (d_.)*(x_)^2]), x_Symbol] := S
imp[(Sqrt[a + b*x^2]*EllipticF[ArcTan[Rt[d/c, 2]*x], 1 - (b*c)/(a*d)]/(a*R
t[d/c, 2]*Sqrt[c + d*x^2]*Sqrt[(c*(a + b*x^2))/(a*(c + d*x^2))]), x] /; Fre
eQ[{a, b, c, d}, x] && PosQ[d/c] && PosQ[b/a] && !SimplerSqrtQ[b/a, d/c]
```

Rule 165

```
Int[Sqrt[(a_.) + (b_.)*(x_)]/(Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(
x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Dist[(2*(a + b*x)*Sqrt[((b*g -
a*h)*(c + d*x))/((d*g - c*h)*(a + b*x))]*Sqrt[((b*g - a*h)*(e + f*x))/((f*
g - e*h)*(a + b*x))])/(Sqrt[c + d*x]*Sqrt[e + f*x]), Subst[Int[1/((h - b*x^
2)*Sqrt[1 + ((b*c - a*d)*x^2)/(d*g - c*h)]*Sqrt[1 + ((b*e - a*f)*x^2)/(f*g
- e*h)]), x], x, Sqrt[g + h*x]/Sqrt[a + b*x]], x] /; FreeQ[{a, b, c, d, e,
f, g, h}, x]
```

Rule 537

```
Int[1/(((a_) + (b_.)*(x_)^2)*Sqrt[(c_) + (d_.)*(x_)^2]*Sqrt[(e_) + (f_.)*(x
_)^2]), x_Symbol] := Simp[(1*EllipticPi[(b*c)/(a*d), ArcSin[Rt[-(d/c), 2]*x
], (c*f)/(d*e)]/(a*Sqrt[c]*Sqrt[e]*Rt[-(d/c), 2]), x] /; FreeQ[{a, b, c, d
, e, f}, x] && !GtQ[d/c, 0] && GtQ[c, 0] && GtQ[e, 0] && !( !GtQ[f/e, 0]
&& SimplerSqrtQ[-(f/e), -(d/c)])
```

Rule 176

```
Int[Sqrt[(c_.) + (d_.)*(x_)]/(((a_.) + (b_.)*(x_))^(3/2)*Sqrt[(e_.) + (f_.)
*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Dist[(-2*Sqrt[c + d*x]*Sqrt[
```

$$-\left(\frac{(b*e - a*f)*(g + h*x)}{(f*g - e*h)*(a + b*x)}\right) / \left(\frac{(b*e - a*f)*\sqrt{g + h*x}}{\sqrt{\frac{(b*e - a*f)*(c + d*x)}{(d*e - c*f)*(a + b*x)}}}\right), \text{Subst}\left[\text{Int}\left[\sqrt{1 + \frac{(b*c - a*d)*x^2}{(d*e - c*f)}} / \sqrt{1 - \frac{(b*g - a*h)*x^2}{(f*g - e*h)}}\right], x, \sqrt{e + f*x} / \sqrt{a + b*x}\right], x] /; \text{FreeQ}\{a, b, c, d, e, f, g, h, x\}$$

Rule 424

$$\text{Int}\left[\sqrt{(a_) + (b_)*(x_)^2} / \sqrt{(c_) + (d_)*(x_)^2}, x_Symbol\right] \rightarrow \text{Simp}\left[\left(\sqrt{a} * \text{EllipticE}\left[\text{ArcSin}\left[\text{Rt}\left[-(d/c), 2\right]*x\right], (b*c)/(a*d)\right]\right) / \left(\sqrt{c} * \text{Rt}\left[-(d/c), 2\right]\right), x\right] /; \text{FreeQ}\{a, b, c, d, x\} \ \&\& \ \text{NegQ}[d/c] \ \&\& \ \text{GtQ}[c, 0] \ \&\& \ \text{GtQ}[a, 0]$$

Rubi steps

$$\begin{aligned} \int \frac{\sqrt{2-3x}\sqrt{1+4x}(7+5x)^{5/2}}{\sqrt{-5+2x}} dx &= \frac{1}{8} \sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^{5/2} - \frac{1}{16} \int \frac{(7+5x)^{3/2}(-621-370x+2890x^2)}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}} \\ &= \frac{1445}{576} \sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^{3/2} + \frac{1}{8} \sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^{5/2} \\ &= \frac{1561915\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}\sqrt{7+5x}}{27648} + \frac{1445}{576} \sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^{5/2} \\ &= \frac{2466927\sqrt{2-3x}\sqrt{1+4x}\sqrt{7+5x}}{4096\sqrt{-5+2x}} + \frac{1561915\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}\sqrt{7+5x}}{27648} + \frac{1}{8} \sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^{5/2} \\ &= \frac{2466927\sqrt{2-3x}\sqrt{1+4x}\sqrt{7+5x}}{4096\sqrt{-5+2x}} + \frac{1561915\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}\sqrt{7+5x}}{27648} + \frac{1}{8} \sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^{5/2} \\ &= \frac{2466927\sqrt{2-3x}\sqrt{1+4x}\sqrt{7+5x}}{4096\sqrt{-5+2x}} + \frac{1561915\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}\sqrt{7+5x}}{27648} + \frac{1}{8} \sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^{5/2} \\ &= \frac{2466927\sqrt{2-3x}\sqrt{1+4x}\sqrt{7+5x}}{4096\sqrt{-5+2x}} + \frac{1561915\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}\sqrt{7+5x}}{27648} + \frac{1}{8} \sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^{5/2} \end{aligned}$$

Mathematica [A] time = 3.66124, size = 345, normalized size = 0.8

$$\sqrt{2x-5}\sqrt{4x+1}\left(10666876180\sqrt{682}\sqrt{\frac{8x^2-18x-5}{(2-3x)^2}}(15x^2+11x-14)\operatorname{EllipticF}\left(\sin^{-1}\left(\sqrt{\frac{31}{39}}\sqrt{\frac{2x-5}{3x-2}}\right),\frac{39}{62}\right)-1238890739\right)$$

Warning: Unable to verify antiderivative.

[In] Integrate[(Sqrt[2 - 3*x]*Sqrt[1 + 4*x]*(7 + 5*x)^(5/2))/Sqrt[-5 + 2*x],x]

[Out] -(Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(-12388907394*Sqrt[682]*Sqrt[(-5 - 18*x + 8*x^2)/(2 - 3*x)^2]*(-14 + 11*x + 15*x^2)*EllipticE[ArcSin[Sqrt[31/39]*Sqrt[(-5 + 2*x)/(-2 + 3*x)]], 39/62] + 10666876180*Sqrt[682]*Sqrt[(-5 - 18*x + 8*x^2)/(2 - 3*x)^2]*(-14 + 11*x + 15*x^2)*EllipticF[ArcSin[Sqrt[31/39]*Sqrt[(-5 + 2*x)/(-2 + 3*x)]], 39/62] + Sqrt[(7 + 5*x)/(-2 + 3*x)]*(186*(-5752341805 - 26349657233*x - 12645389558*x^2 + 3088122056*x^3 + 1004819520*x^4 + 439372800*x^5 + 82944000*x^6) + 10695945839*Sqrt[682]*(2 - 3*x)^2*Sqrt[(1 + 4*x)/(-2 + 3*x)]*Sqrt[(-35 - 11*x + 10*x^2)/(2 - 3*x)^2]*EllipticPi[117/62, ArcSin[Sqrt[31/39]*Sqrt[(-5 + 2*x)/(-2 + 3*x)]], 39/62]))/(41140224*Sqrt[2 - 3*x]*Sqrt[7 + 5*x]*Sqrt[(7 + 5*x)/(-2 + 3*x)]*(-5 - 18*x + 8*x^2))

Maple [B] time = 0.031, size = 890, normalized size = 2.1

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] int((7+5*x)^(5/2)*(2-3*x)^(1/2)*(4*x+1)^(1/2)/(2*x-5)^(1/2),x)

[Out] -1/948879360*(7+5*x)^(1/2)*(2-3*x)^(1/2)*(4*x+1)^(1/2)*(2*x-5)^(1/2)*(424170712240*11^(1/2)*((7+5*x)/(4*x+1))^(1/2)*3^(1/2)*13^(1/2)*((2*x-5)/(4*x+1))^(1/2)*((-2+3*x)/(4*x+1))^(1/2)*x^2*EllipticF(1/31*31^(1/2)*11^(1/2)*((7+5*x)/(4*x+1))^(1/2),1/39*31^(1/2)*78^(1/2))-3936108068752*11^(1/2)*((7+5*x)/(4*x+1))^(1/2)*3^(1/2)*13^(1/2)*((2*x-5)/(4*x+1))^(1/2)*((-2+3*x)/(4*x+1))^(1/2)*x^2*EllipticPi(1/31*31^(1/2)*11^(1/2)*((7+5*x)/(4*x+1))^(1/2),124/55,1/39*31^(1/2)*78^(1/2))-4571906470560*11^(1/2)*((7+5*x)/(4*x+1))^(1/2)*3^(1/2)*13^(1/2)*((2*x-5)/(4*x+1))^(1/2)*((-2+3*x)/(4*x+1))^(1/2)*x^2*EllipticE(1/31*31^(1/2)*11^(1/2)*((7+5*x)/(4*x+1))^(1/2),1/39*31^(1/2)*78^(1/2))+212085356120*11^(1/2)*((7+5*x)/(4*x+1))^(1/2)*3^(1/2)*13^(1/2)*((2*x-5)/(4*x+1))^(1/2)*((-2+3*x)/(4*x+1))^(1/2)*x*EllipticF(1/31*31^(1/2)*11^(1/2)*((7+5*x)/(4*x+1))^(1/2),1/39*31^(1/2)*78^(1/2))-1968054034376*11^(1/2)*((7+5*x)/(4

```

*x+1))^(1/2)*3^(1/2)*13^(1/2)*((2*x-5)/(4*x+1))^(1/2)*((-2+3*x)/(4*x+1))^(1
/2)*x*EllipticPi(1/31*31^(1/2)*11^(1/2)*((7+5*x)/(4*x+1))^(1/2),124/55,1/39
*31^(1/2)*78^(1/2))-2285953235280*11^(1/2)*((7+5*x)/(4*x+1))^(1/2)*3^(1/2)*
13^(1/2)*((2*x-5)/(4*x+1))^(1/2)*((-2+3*x)/(4*x+1))^(1/2)*x*EllipticE(1/31*
31^(1/2)*11^(1/2)*((7+5*x)/(4*x+1))^(1/2),1/39*31^(1/2)*78^(1/2))+265106695
15*11^(1/2)*((7+5*x)/(4*x+1))^(1/2)*3^(1/2)*13^(1/2)*((2*x-5)/(4*x+1))^(1/2
)*((-2+3*x)/(4*x+1))^(1/2)*EllipticF(1/31*31^(1/2)*11^(1/2)*((7+5*x)/(4*x+1
))^(1/2),1/39*31^(1/2)*78^(1/2))-246006754297*11^(1/2)*((7+5*x)/(4*x+1))^(1
/2)*3^(1/2)*13^(1/2)*((2*x-5)/(4*x+1))^(1/2)*((-2+3*x)/(4*x+1))^(1/2)*Ellip
ticPi(1/31*31^(1/2)*11^(1/2)*((7+5*x)/(4*x+1))^(1/2),124/55,1/39*31^(1/2)*7
8^(1/2))-285744154410*11^(1/2)*((7+5*x)/(4*x+1))^(1/2)*3^(1/2)*13^(1/2)*((2
*x-5)/(4*x+1))^(1/2)*((-2+3*x)/(4*x+1))^(1/2)*EllipticE(1/31*31^(1/2)*11^(1
/2)*((7+5*x)/(4*x+1))^(1/2),1/39*31^(1/2)*78^(1/2))-355829760000*x^6-188490
9312000*x^5-4310675740800*x^4-13248043620240*x^3+85680578188920*x^2+7846498
6845960*x-85333953104400)/(120*x^4-182*x^3-385*x^2+197*x+70)

```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(5x+7)^{\frac{5}{2}} \sqrt{4x+1} \sqrt{-3x+2}}{\sqrt{2x-5}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((7+5*x)^(5/2)*(2-3*x)^(1/2)*(1+4*x)^(1/2)/(-5+2*x)^(1/2),x, algor
ithm="maxima")
```

```
[Out] integrate((5*x + 7)^(5/2)*sqrt(4*x + 1)*sqrt(-3*x + 2)/sqrt(2*x - 5), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{(25x^2 + 70x + 49)\sqrt{5x+7}\sqrt{4x+1}\sqrt{-3x+2}}{\sqrt{2x-5}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((7+5*x)^(5/2)*(2-3*x)^(1/2)*(1+4*x)^(1/2)/(-5+2*x)^(1/2),x, algor
ithm="fricas")
```

[Out] integral((25*x^2 + 70*x + 49)*sqrt(5*x + 7)*sqrt(4*x + 1)*sqrt(-3*x + 2)/sqrt(2*x - 5), x)

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((7+5*x)**(5/2)*(2-3*x)**(1/2)*(1+4*x)**(1/2)/(-5+2*x)**(1/2), x)

[Out] Timed out

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(5x + 7)^{\frac{5}{2}} \sqrt{4x + 1} \sqrt{-3x + 2}}{\sqrt{2x - 5}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((7+5*x)^(5/2)*(2-3*x)^(1/2)*(1+4*x)^(1/2)/(-5+2*x)^(1/2), x, algorithm="giac")

[Out] integrate((5*x + 7)^(5/2)*sqrt(4*x + 1)*sqrt(-3*x + 2)/sqrt(2*x - 5), x)

$$3.86 \quad \int \frac{\sqrt{2-3x}\sqrt{1+4x}(7+5x)^{3/2}}{\sqrt{-5+2x}} dx$$

Optimal. Leaf size=391

$$\frac{2824441\sqrt{\frac{11}{23}}\sqrt{5x+7}\text{EllipticF}\left(\tan^{-1}\left(\frac{\sqrt{4x+1}}{\sqrt{2}\sqrt{2-3x}}\right), -\frac{39}{23}\right)}{17280\sqrt{2x-5}\sqrt{\frac{5x+7}{5-2x}}} + \frac{1}{6}\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}(5x+7)^{3/2} + \frac{977}{288}\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}\sqrt{5x+7}$$

[Out] (66377*Sqrt[2 - 3*x]*Sqrt[1 + 4*x]*Sqrt[7 + 5*x])/(1920*Sqrt[-5 + 2*x]) + (977*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*Sqrt[7 + 5*x])/288 + (Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(7 + 5*x)^(3/2))/6 - (66377*Sqrt[143/3]*Sqrt[2 - 3*x]*Sqrt[(7 + 5*x)/(5 - 2*x)]*EllipticE[ArcSin[(Sqrt[39/23]*Sqrt[1 + 4*x])/Sqrt[-5 + 2*x]], -23/39])/(1280*Sqrt[(2 - 3*x)/(5 - 2*x)]*Sqrt[7 + 5*x]) + (2824441*Sqrt[11/23]*Sqrt[7 + 5*x]*EllipticF[ArcTan[Sqrt[1 + 4*x]/(Sqrt[2]*Sqrt[2 - 3*x])], -39/23])/(17280*Sqrt[-5 + 2*x]*Sqrt[(7 + 5*x)/(5 - 2*x)]) + (963142751*(2 - 3*x)*Sqrt[(5 - 2*x)/(2 - 3*x)]*Sqrt[-((1 + 4*x)/(2 - 3*x))]*EllipticPi[-69/55, ArcSin[(Sqrt[11/23]*Sqrt[7 + 5*x])/Sqrt[2 - 3*x]], -23/39])/(86400*Sqrt[429]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])

Rubi [A] time = 0.411787, antiderivative size = 391, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 10, integrand size = 37, $\frac{\text{number of rules}}{\text{integrand size}} = 0.27$, Rules used = {162, 1600, 1602, 1598, 170, 418, 165, 537, 176, 424}

$$\frac{1}{6}\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}(5x+7)^{3/2} + \frac{977}{288}\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}\sqrt{5x+7} + \frac{66377\sqrt{2-3x}\sqrt{4x+1}\sqrt{5x+7}}{1920\sqrt{2x-5}} + \frac{2824441\sqrt{\frac{11}{23}}\sqrt{5x+7}\text{EllipticF}\left(\tan^{-1}\left(\frac{\sqrt{4x+1}}{\sqrt{2}\sqrt{2-3x}}\right), -\frac{39}{23}\right)}{17280\sqrt{2x-5}\sqrt{\frac{5x+7}{5-2x}}}$$

Antiderivative was successfully verified.

[In] Int[(Sqrt[2 - 3*x]*Sqrt[1 + 4*x]*(7 + 5*x)^(3/2))/Sqrt[-5 + 2*x], x]

[Out] (66377*Sqrt[2 - 3*x]*Sqrt[1 + 4*x]*Sqrt[7 + 5*x])/(1920*Sqrt[-5 + 2*x]) + (977*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*Sqrt[7 + 5*x])/288 + (Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(7 + 5*x)^(3/2))/6 - (66377*Sqrt[143/3]*Sqrt[2 - 3*x]*Sqrt[(7 + 5*x)/(5 - 2*x)]*EllipticE[ArcSin[(Sqrt[39/23]*Sqrt[1 + 4*x])/Sqrt[-5 + 2*x]], -23/39])/(1280*Sqrt[(2 - 3*x)/(5 - 2*x)]*Sqrt[7 + 5*x]) + (2824441*Sqrt[11/23]*Sqrt[7 + 5*x]*EllipticF[ArcTan[Sqrt[1 + 4*x]/(Sqrt[2]*Sqrt[2 - 3*x])], -39/23])/(17280*Sqrt[-5 + 2*x]*Sqrt[(7 + 5*x)/(5 - 2*x)]) + (963142751*(2 - 3*x)*Sqrt[(5 - 2*x)/(2 - 3*x)]*Sqrt[-((1 + 4*x)/(2 - 3*x))]*EllipticPi[-69/55, ArcSin[(Sqrt[11/23]*Sqrt[7 + 5*x])/Sqrt[2 - 3*x]], -23/39])/(86400*Sqrt[429]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])

$x)/(2 - 3x)) * \text{EllipticPi}[-69/55, \text{ArcSin}[(\text{Sqrt}[11/23] * \text{Sqrt}[7 + 5x]) / \text{Sqrt}[2 - 3x]], -23/39]) / (86400 * \text{Sqrt}[429] * \text{Sqrt}[-5 + 2x] * \text{Sqrt}[1 + 4x])$

Rule 162

$\text{Int}[\frac{((a_.) + (b_.)(x_.))^{(m_.)} * \text{Sqrt}[(e_.) + (f_.)(x_.)] * \text{Sqrt}[(g_.) + (h_.)(x_.)]}{\text{Sqrt}[(c_.) + (d_.)(x_.)]}, x_Symbol] \rightarrow \text{Simp}[(2*(a + b*x)^m * \text{Sqrt}[c + d*x] * \text{Sqrt}[e + f*x] * \text{Sqrt}[g + h*x]) / (d*(2*m + 3)), x] - \text{Dist}[1/(d*(2*m + 3)), \text{Int}[\frac{(a + b*x)^{(m-1)} * \text{Sqrt}[c + d*x] * \text{Sqrt}[e + f*x] * \text{Sqrt}[g + h*x]}{(d*(2*m + 3))}] * \text{Simp}[2*b*c*e*g*m + a*(c*(f*g + e*h) - 2*d*e*g*(m + 1)) - (b*(2*d*e*g - c*(f*g + e*h))*(2*m + 1)) - a*(2*c*f*h - d*(2*m + 1)*(f*g + e*h))] * x - (2*a*d*f*h*m + b*(d*(f*g + e*h) - 2*c*f*h*(m + 1))) * x^2, x], x] /; \text{FreeQ}\{a, b, c, d, e, f, g, h, m\}, x] \&\& \text{IntegerQ}[2*m] \&\& \text{GtQ}[m, 0]$

Rule 1600

$\text{Int}[\frac{((a_.) + (b_.)(x_.))^{(m_.)} * ((A_.) + (B_.)(x_.) + (C_.)(x_.)^2)}{\text{Sqrt}[(c_.) + (d_.)(x_.)] * \text{Sqrt}[(e_.) + (f_.)(x_.)] * \text{Sqrt}[(g_.) + (h_.)(x_.)]}, x_Symbol] \rightarrow \text{Simp}[(2*C*(a + b*x)^m * \text{Sqrt}[c + d*x] * \text{Sqrt}[e + f*x] * \text{Sqrt}[g + h*x]) / (d*f*h*(2*m + 3)), x] + \text{Dist}[1/(d*f*h*(2*m + 3)), \text{Int}[\frac{(a + b*x)^{(m-1)} * \text{Sqrt}[c + d*x] * \text{Sqrt}[e + f*x] * \text{Sqrt}[g + h*x]}{(d*f*h*(2*m + 3))}] * \text{Simp}[a*A*d*f*h*(2*m + 3) - C*(a*(d*e*g + c*f*g + c*e*h) + 2*b*c*e*g*m) + ((A*b + a*B)*d*f*h*(2*m + 3) - C*(2*a*(d*f*g + d*e*h + c*f*h) + b*(2*m + 1)*(d*e*g + c*f*g + c*e*h))] * x + (b*B*d*f*h*(2*m + 3) + 2*C*(a*d*f*h*m - b*(m + 1)*(d*f*g + d*e*h + c*f*h))] * x^2, x], x] /; \text{FreeQ}\{a, b, c, d, e, f, g, h, A, B, C\}, x] \&\& \text{IntegerQ}[2*m] \&\& \text{GtQ}[m, 0]$

Rule 1602

$\text{Int}[\frac{((A_.) + (B_.)(x_.) + (C_.)(x_.)^2)}{\text{Sqrt}[(a_.) + (b_.)(x_.)] * \text{Sqrt}[(c_.) + (d_.)(x_.)] * \text{Sqrt}[(e_.) + (f_.)(x_.)] * \text{Sqrt}[(g_.) + (h_.)(x_.)]}, x_Symbol] \rightarrow \text{Simp}[(C * \text{Sqrt}[a + b*x] * \text{Sqrt}[e + f*x] * \text{Sqrt}[g + h*x]) / (b*f*h * \text{Sqrt}[c + d*x]), x] + (\text{Dist}[1/(2*b*d*f*h), \text{Int}[(1 * \text{Simp}[2*A*b*d*f*h - C*(b*d*e*g + a*c*f*h) + (2*b*B*d*f*h - C*(a*d*f*h + b*(d*f*g + d*e*h + c*f*h))] * x, x)] / (\text{Sqrt}[a + b*x] * \text{Sqrt}[c + d*x] * \text{Sqrt}[e + f*x] * \text{Sqrt}[g + h*x]), x], x] + \text{Dist}[(C*(d*e - c*f)*(d*g - c*h)) / (2*b*d*f*h), \text{Int}[\text{Sqrt}[a + b*x] / ((c + d*x)^{(3/2)} * \text{Sqrt}[e + f*x] * \text{Sqrt}[g + h*x]), x], x)] /; \text{FreeQ}\{a, b, c, d, e, f, g, h, A, B, C\}, x]$

Rule 1598

$\text{Int}[\frac{((A_.) + (B_.)(x_.))}{\text{Sqrt}[(a_.) + (b_.)(x_.)] * \text{Sqrt}[(c_.) + (d_.)(x_.)] * \text{Sqrt}[(e_.) + (f_.)(x_.)] * \text{Sqrt}[(g_.) + (h_.)(x_.)]}, x_Symbol] \rightarrow \text{Dist}[(A*b - a*B)/b, \text{Int}[1/(\text{Sqrt}[a + b*x] * \text{Sqrt}[c + d*x] * \text{Sqrt}[e + f*x] * \text{Sqrt}[g + h*x]), x], x] + \text{Dist}[B/b, \text{Int}[\text{Sqrt}[a + b*x] / (\text{Sqrt}[c + d*x] * \text{Sqrt}[e + f*x] * \text{Sqrt}[g + h*x]), x], x]$

$h*x]), x], x] /; \text{FreeQ}\{a, b, c, d, e, f, g, h, A, B\}, x]$

Rule 170

$\text{Int}[1/(\text{Sqrt}[(a_.) + (b_.)*(x_)]*\text{Sqrt}[(c_.) + (d_.)*(x_)]*\text{Sqrt}[(e_.) + (f_.)*(x_)]*\text{Sqrt}[(g_.) + (h_.)*(x_)]), x_Symbol] \rightarrow \text{Dist}[(2*\text{Sqrt}[g + h*x]*\text{Sqrt}[(b*e - a*f)*(c + d*x)]/((d*e - c*f)*(a + b*x))]/((f*g - e*h)*\text{Sqrt}[c + d*x]*\text{Sqrt}[-(((b*e - a*f)*(g + h*x))/((f*g - e*h)*(a + b*x)))]), \text{Subst}[\text{Int}[1/(\text{Sqrt}[1 + ((b*c - a*d)*x^2)/(d*e - c*f)]*\text{Sqrt}[1 - ((b*g - a*h)*x^2)/(f*g - e*h)]), x], x, \text{Sqrt}[e + f*x]/\text{Sqrt}[a + b*x]], x] /; \text{FreeQ}\{a, b, c, d, e, f, g, h\}, x]$

Rule 418

$\text{Int}[1/(\text{Sqrt}[(a_) + (b_.)*(x_)^2]*\text{Sqrt}[(c_) + (d_.)*(x_)^2]), x_Symbol] \rightarrow \text{Simp}[(\text{Sqrt}[a + b*x^2]*\text{EllipticF}[\text{ArcTan}[\text{Rt}[d/c, 2]*x], 1 - (b*c)/(a*d)]/(a*\text{Rt}[d/c, 2]*\text{Sqrt}[c + d*x^2]*\text{Sqrt}[(c*(a + b*x^2))/(a*(c + d*x^2))]), x] /; \text{FreeQ}\{a, b, c, d\}, x] \&\& \text{PosQ}[d/c] \&\& \text{PosQ}[b/a] \&\& !\text{SimplerSqrtQ}[b/a, d/c]$

Rule 165

$\text{Int}[\text{Sqrt}[(a_.) + (b_.)*(x_)]/(\text{Sqrt}[(c_.) + (d_.)*(x_)]*\text{Sqrt}[(e_.) + (f_.)*(x_)]*\text{Sqrt}[(g_.) + (h_.)*(x_)]), x_Symbol] \rightarrow \text{Dist}[(2*(a + b*x)*\text{Sqrt}[(b*g - a*h)*(c + d*x)]/((d*g - c*h)*(a + b*x))]*\text{Sqrt}[(b*g - a*h)*(e + f*x)]/((f*g - e*h)*(a + b*x))]/(\text{Sqrt}[c + d*x]*\text{Sqrt}[e + f*x]), \text{Subst}[\text{Int}[1/((h - b*x^2)*\text{Sqrt}[1 + ((b*c - a*d)*x^2)/(d*g - c*h)]*\text{Sqrt}[1 + ((b*e - a*f)*x^2)/(f*g - e*h)]), x], x, \text{Sqrt}[g + h*x]/\text{Sqrt}[a + b*x]], x] /; \text{FreeQ}\{a, b, c, d, e, f, g, h\}, x]$

Rule 537

$\text{Int}[1/(((a_) + (b_.)*(x_)^2)*\text{Sqrt}[(c_) + (d_.)*(x_)^2]*\text{Sqrt}[(e_) + (f_.)*(x_)^2]), x_Symbol] \rightarrow \text{Simp}[(1*\text{EllipticPi}[(b*c)/(a*d), \text{ArcSin}[\text{Rt}[-(d/c), 2]*x], (c*f)/(d*e)]/(a*\text{Sqrt}[c]*\text{Sqrt}[e]*\text{Rt}[-(d/c), 2]), x] /; \text{FreeQ}\{a, b, c, d, e, f\}, x] \&\& !\text{GtQ}[d/c, 0] \&\& \text{GtQ}[c, 0] \&\& \text{GtQ}[e, 0] \&\& !(!\text{GtQ}[f/e, 0] \&\& \text{SimplerSqrtQ}[-(f/e), -(d/c)])]$

Rule 176

$\text{Int}[\text{Sqrt}[(c_.) + (d_.)*(x_)]/(((a_.) + (b_.)*(x_))^(3/2)*\text{Sqrt}[(e_.) + (f_.)*(x_)]*\text{Sqrt}[(g_.) + (h_.)*(x_)]), x_Symbol] \rightarrow \text{Dist}[(-2*\text{Sqrt}[c + d*x]*\text{Sqrt}[-(((b*e - a*f)*(g + h*x))/((f*g - e*h)*(a + b*x)))]/((b*e - a*f)*\text{Sqrt}[g + h*x]*\text{Sqrt}[(b*e - a*f)*(c + d*x)]/((d*e - c*f)*(a + b*x)))]), \text{Subst}[\text{Int}[\text{Sqrt}[1 + ((b*c - a*d)*x^2)/(d*e - c*f)]/\text{Sqrt}[1 - ((b*g - a*h)*x^2)/(f*g - e*h)], x], x, \text{Sqrt}[e + f*x]/\text{Sqrt}[a + b*x]], x] /; \text{FreeQ}\{a, b, c, d, e, f, g, h\}$

, x]

Rule 424

```
Int[Sqrt[(a_) + (b_.)*(x_)^2]/Sqrt[(c_) + (d_.)*(x_)^2], x_Symbol] := Simp[
(Sqrt[a]*EllipticE[ArcSin[Rt[-(d/c), 2]*x], (b*c)/(a*d)]/(Sqrt[c]*Rt[-(d/c)
), 2]), x] /; FreeQ[{a, b, c, d}, x] && NegQ[d/c] && GtQ[c, 0] && GtQ[a, 0]
```

Rubi steps

$$\begin{aligned}
\int \frac{\sqrt{2-3x}\sqrt{1+4x}(7+5x)^{3/2}}{\sqrt{-5+2x}} dx &= \frac{1}{6}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^{3/2} - \frac{1}{12} \int \frac{\sqrt{7+5x}(-465+20x+1954x^2)}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}} dx \\
&= \frac{977}{288}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}\sqrt{7+5x} + \frac{1}{6}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^{3/2} + \\
&= \frac{66377\sqrt{2-3x}\sqrt{1+4x}\sqrt{7+5x}}{1920\sqrt{-5+2x}} + \frac{977}{288}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}\sqrt{7+5x} + \frac{1}{6}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^{3/2} \\
&= \frac{66377\sqrt{2-3x}\sqrt{1+4x}\sqrt{7+5x}}{1920\sqrt{-5+2x}} + \frac{977}{288}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}\sqrt{7+5x} + \frac{1}{6}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^{3/2} \\
&= \frac{66377\sqrt{2-3x}\sqrt{1+4x}\sqrt{7+5x}}{1920\sqrt{-5+2x}} + \frac{977}{288}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}\sqrt{7+5x} + \frac{1}{6}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^{3/2} \\
&= \frac{66377\sqrt{2-3x}\sqrt{1+4x}\sqrt{7+5x}}{1920\sqrt{-5+2x}} + \frac{977}{288}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}\sqrt{7+5x} + \frac{1}{6}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^{3/2}
\end{aligned}$$

Mathematica [A] time = 3.59569, size = 340, normalized size = 0.87

$$\frac{\sqrt{2x-5}\sqrt{4x+1} \left(31389484\sqrt{682}\sqrt{\frac{8x^2-18x-5}{(2-3x)^2}} (15x^2+11x-14) \operatorname{EllipticF}\left(\sin^{-1}\left(\sqrt{\frac{31}{39}}\sqrt{\frac{2x-5}{3x-2}}\right), \frac{39}{62}\right) - 37038366\sqrt{682}\right)}{1}$$

Warning: Unable to verify antiderivative.

[In] Integrate[(Sqrt[2 - 3*x]*Sqrt[1 + 4*x]*(7 + 5*x)^(3/2))/Sqrt[-5 + 2*x], x]

[Out] $-(\text{Sqrt}[-5 + 2x] \cdot \text{Sqrt}[1 + 4x] \cdot (-37038366 \cdot \text{Sqrt}[682] \cdot \text{Sqrt}[(-5 - 18x + 8x^2)/(2 - 3x)^2] \cdot (-14 + 11x + 15x^2) \cdot \text{EllipticE}[\text{ArcSin}[\text{Sqrt}[31/39] \cdot \text{Sqrt}[(-5 + 2x)/(-2 + 3x)]]], 39/62] + 31389484 \cdot \text{Sqrt}[682] \cdot \text{Sqrt}[(-5 - 18x + 8x^2)/(2 - 3x)^2] \cdot (-14 + 11x + 15x^2) \cdot \text{EllipticF}[\text{ArcSin}[\text{Sqrt}[31/39] \cdot \text{Sqrt}[(-5 + 2x)/(-2 + 3x)]]], 39/62] + \text{Sqrt}[(7 + 5x)/(-2 + 3x)] \cdot (186 \cdot (-17232355 - 79187903x - 38640362x^2 + 10641080x^3 + 4555200x^4 + 1152000x^5) + 31069121 \cdot \text{Sqrt}[682] \cdot (2 - 3x)^2 \cdot \text{Sqrt}[(1 + 4x)/(-2 + 3x)] \cdot \text{Sqrt}[(-35 - 11x + 10x^2)/(2 - 3x)^2] \cdot \text{EllipticPi}[117/62, \text{ArcSin}[\text{Sqrt}[31/39] \cdot \text{Sqrt}[(-5 + 2x)/(-2 + 3x)]]], 39/62)))/((2142720 \cdot \text{Sqrt}[2 - 3x] \cdot \text{Sqrt}[7 + 5x] \cdot \text{Sqrt}[(7 + 5x)/(-2 + 3x)] \cdot (-5 - 18x + 8x^2))$

Maple [B] time = 0.02, size = 885, normalized size = 2.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] int((7+5*x)^(3/2)*(2-3*x)^(1/2)*(4*x+1)^(1/2)/(2*x-5)^(1/2), x)

[Out] $-1/49420800 \cdot (7+5x)^{1/2} \cdot (2-3x)^{1/2} \cdot (4x+1)^{1/2} \cdot (2x-5)^{1/2} \cdot (1240732240 \cdot 11^{1/2} \cdot ((7+5x)/(4x+1))^{1/2} \cdot 3^{1/2} \cdot 13^{1/2} \cdot ((2x-5)/(4x+1))^{1/2} \cdot ((-2+3x)/(4x+1))^{1/2} \cdot x^2 \cdot \text{EllipticF}(1/31 \cdot 31^{1/2} \cdot 11^{1/2} \cdot ((7+5x)/(4x+1))^{1/2}, 1/39 \cdot 31^{1/2} \cdot 78^{1/2}) - 11433436528 \cdot 11^{1/2} \cdot ((7+5x)/(4x+1))^{1/2} \cdot 3^{1/2} \cdot 13^{1/2} \cdot ((2x-5)/(4x+1))^{1/2} \cdot ((-2+3x)/(4x+1))^{1/2} \cdot x^2 \cdot \text{EllipticPi}(1/31 \cdot 31^{1/2} \cdot 11^{1/2} \cdot ((7+5x)/(4x+1))^{1/2}, 124/55, 1/39 \cdot 31^{1/2} \cdot 78^{1/2}) - 13668351840 \cdot 11^{1/2} \cdot ((7+5x)/(4x+1))^{1/2} \cdot 3^{1/2} \cdot 13^{1/2} \cdot ((2x-5)/(4x+1))^{1/2} \cdot ((-2+3x)/(4x+1))^{1/2} \cdot x^2 \cdot \text{EllipticE}(1/31 \cdot 31^{1/2} \cdot 11^{1/2} \cdot ((7+5x)/(4x+1))^{1/2}, 1/39 \cdot 31^{1/2} \cdot 78^{1/2}) + 620366120 \cdot 11^{1/2} \cdot ((7+5x)/(4x+1))^{1/2} \cdot 3^{1/2} \cdot 13^{1/2} \cdot ((2x-5)/(4x+1))^{1/2} \cdot ((-2+3x)/(4x+1))^{1/2} \cdot x \cdot \text{EllipticF}(1/31 \cdot 31^{1/2} \cdot 11^{1/2} \cdot ((7+5x)/(4x+1))^{1/2}, 1/39 \cdot 31^{1/2} \cdot 78^{1/2}) - 5716718264 \cdot 11^{1/2} \cdot ((7+5x)/(4x+1))^{1/2} \cdot 3^{1/2} \cdot 13^{1/2} \cdot ((2x-5)/(4x+1))^{1/2} \cdot ((-2+3x)/(4x+1))^{1/2} \cdot x \cdot \text{EllipticPi}(1/31 \cdot 31^{1/2} \cdot 11^{1/2} \cdot ((7+5x)/(4x+1))^{1/2}, 124/55, 1/39 \cdot 31^{1/2} \cdot 78^{1/2}) - 6834175920 \cdot 11^{1/2} \cdot ((7+5x)/(4x+1))^{1/2} \cdot 3^{1/2} \cdot 13^{1/2} \cdot ((2x-5)/(4x+1))^{1/2} \cdot ((-2+3x)/(4x+1))^{1/2} \cdot x \cdot \text{EllipticE}(1/31 \cdot 31^{1/2} \cdot 11^{1/2} \cdot ((7+5x)/(4x+1))^{1/2}, 1/39 \cdot 31^{1/2} \cdot 78^{1/2}) + 77545765 \cdot 11^{1/2} \cdot ((7+5x)/(4x+1))^{1/2} \cdot 3^{1/2} \cdot 13^{1/2} \cdot ((2x-5)/(4x+1))^{1/2} \cdot ((-2+3x)/(4x+1))^{1/2} \cdot \text{EllipticF}(1/31 \cdot 31^{1/2} \cdot 11^{1/2} \cdot ((7+5x)/(4x+1))^{1/2}, 1/39 \cdot 31^{1/2} \cdot 78^{1/2}) - 714589783 \cdot 11^{1/2} \cdot ((7+5x)/(4x+1))^{1/2} \cdot 3^{1/2} \cdot 13^{1/2} \cdot ((2x-5)/(4x+1))^{1/2} \cdot ((-2+3x)/(4x+1))^{1/2} \cdot \text{EllipticPi}(1/31 \cdot 31^{1/2} \cdot 11$

$^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}, 124/55, 1/39*31^{(1/2)}*78^{(1/2)}-854271990*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}*3^{(1/2)}*13^{(1/2)}*((2*x-5)/(4*x+1))^{(1/2)}*((-2+3*x)/(4*x+1))^{(1/2)}*EllipticE(1/31*31^{(1/2)}*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}, 1/39*31^{(1/2)}*78^{(1/2)})-4942080000*x^5-19541808000*x^4-45650233200*x^3+259737071880*x^2+236349193080*x-254967913200)/(120*x^4-182*x^3-385*x^2+197*x+70)$

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(5x+7)^{\frac{3}{2}}\sqrt{4x+1}\sqrt{-3x+2}}{\sqrt{2x-5}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((7+5*x)^(3/2)*(2-3*x)^(1/2)*(1+4*x)^(1/2)/(-5+2*x)^(1/2),x, algorithm="maxima")

[Out] integrate((5*x + 7)^(3/2)*sqrt(4*x + 1)*sqrt(-3*x + 2)/sqrt(2*x - 5), x)

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{(5x+7)^{\frac{3}{2}}\sqrt{4x+1}\sqrt{-3x+2}}{\sqrt{2x-5}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((7+5*x)^(3/2)*(2-3*x)^(1/2)*(1+4*x)^(1/2)/(-5+2*x)^(1/2),x, algorithm="fricas")

[Out] integral((5*x + 7)^(3/2)*sqrt(4*x + 1)*sqrt(-3*x + 2)/sqrt(2*x - 5), x)

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((7+5*x)**(3/2)*(2-3*x)**(1/2)*(1+4*x)**(1/2)/(-5+2*x)**(1/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(5x+7)^{\frac{3}{2}} \sqrt{4x+1} \sqrt{-3x+2}}{\sqrt{2x-5}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((7+5*x)^(3/2)*(2-3*x)^(1/2)*(1+4*x)^(1/2)/(-5+2*x)^(1/2),x, algorithm="giac")
```

```
[Out] integrate((5*x + 7)^(3/2)*sqrt(4*x + 1)*sqrt(-3*x + 2)/sqrt(2*x - 5), x)
```

$$3.87 \quad \int \frac{\sqrt{2-3x}\sqrt{1+4x}\sqrt{7+5x}}{\sqrt{-5+2x}} dx$$

Optimal. Leaf size=351

$$\frac{8959\sqrt{\frac{11}{23}}\sqrt{5x+7}\text{EllipticF}\left(\tan^{-1}\left(\frac{\sqrt{4x+1}}{\sqrt{2}\sqrt{2-3x}}\right), -\frac{39}{23}\right)}{720\sqrt{2x-5}\sqrt{\frac{5x+7}{5-2x}}} + \frac{1}{4}\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}\sqrt{5x+7} + \frac{509\sqrt{2-3x}\sqrt{4x+1}\sqrt{5x+7}}{240\sqrt{2x-5}}$$

```
[Out] (509*Sqrt[2 - 3*x]*Sqrt[1 + 4*x]*Sqrt[7 + 5*x])/(240*Sqrt[-5 + 2*x]) + (Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*Sqrt[7 + 5*x])/4 - (509*Sqrt[143/3]*Sqrt[2 - 3*x]*Sqrt[(7 + 5*x)/(5 - 2*x)]*EllipticE[ArcSin[(Sqrt[39/23]*Sqrt[1 + 4*x])/Sqrt[-5 + 2*x]], -23/39])/(160*Sqrt[(2 - 3*x)/(5 - 2*x)]*Sqrt[7 + 5*x]) + (8959*Sqrt[11/23]*Sqrt[7 + 5*x]*EllipticF[ArcTan[Sqrt[1 + 4*x]/(Sqrt[2]*Sqrt[2 - 3*x])], -39/23])/(720*Sqrt[-5 + 2*x]*Sqrt[(7 + 5*x)/(5 - 2*x)]) + (2198489*(2 - 3*x)*Sqrt[(5 - 2*x)/(2 - 3*x)]*Sqrt[-((1 + 4*x)/(2 - 3*x))]*EllipticPi[-69/55, ArcSin[(Sqrt[11/23]*Sqrt[7 + 5*x])/Sqrt[2 - 3*x]], -23/39])/(3600*Sqrt[429]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])
```

Rubi [A] time = 0.316346, antiderivative size = 351, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 9, integrand size = 37, $\frac{\text{number of rules}}{\text{integrand size}} = 0.243$, Rules used = {161, 1602, 1598, 170, 418, 165, 537, 176, 424}

$$\frac{1}{4}\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}\sqrt{5x+7} + \frac{509\sqrt{2-3x}\sqrt{4x+1}\sqrt{5x+7}}{240\sqrt{2x-5}} + \frac{8959\sqrt{\frac{11}{23}}\sqrt{5x+7}\text{F}\left(\tan^{-1}\left(\frac{\sqrt{4x+1}}{\sqrt{2}\sqrt{2-3x}}\right)\middle| -\frac{39}{23}\right)}{720\sqrt{2x-5}\sqrt{\frac{5x+7}{5-2x}}} - \dots$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[2 - 3*x]*Sqrt[1 + 4*x]*Sqrt[7 + 5*x])/Sqrt[-5 + 2*x], x]
```

```
[Out] (509*Sqrt[2 - 3*x]*Sqrt[1 + 4*x]*Sqrt[7 + 5*x])/(240*Sqrt[-5 + 2*x]) + (Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*Sqrt[7 + 5*x])/4 - (509*Sqrt[143/3]*Sqrt[2 - 3*x]*Sqrt[(7 + 5*x)/(5 - 2*x)]*EllipticE[ArcSin[(Sqrt[39/23]*Sqrt[1 + 4*x])/Sqrt[-5 + 2*x]], -23/39])/(160*Sqrt[(2 - 3*x)/(5 - 2*x)]*Sqrt[7 + 5*x]) + (8959*Sqrt[11/23]*Sqrt[7 + 5*x]*EllipticF[ArcTan[Sqrt[1 + 4*x]/(Sqrt[2]*Sqrt[2 - 3*x])], -39/23])/(720*Sqrt[-5 + 2*x]*Sqrt[(7 + 5*x)/(5 - 2*x)]) + (2198489*(2 - 3*x)*Sqrt[(5 - 2*x)/(2 - 3*x)]*Sqrt[-((1 + 4*x)/(2 - 3*x))]*EllipticPi[-69/55, ArcSin[(Sqrt[11/23]*Sqrt[7 + 5*x])/Sqrt[2 - 3*x]], -23/39])/(3600*Sqrt[429]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])
```

$-23/39]/(3600*\text{Sqrt}[429]*\text{Sqrt}[-5 + 2*x]*\text{Sqrt}[1 + 4*x])$

Rule 161

$\text{Int}[(a_.) + (b_.)*(x_.)]^{(m_.)}*\text{Sqrt}[(c_.) + (d_.)*(x_.)]*\text{Sqrt}[(e_.) + (f_.)*(x_.)]*\text{Sqrt}[(g_.) + (h_.)*(x_.)], x_Symbol] \rightarrow \text{Simp}[(2*(a + b*x)^{(m + 1)}*\text{Sqrt}[c + d*x]*\text{Sqrt}[e + f*x]*\text{Sqrt}[g + h*x])/(b*(2*m + 5)), x] + \text{Dist}[1/(b*(2*m + 5)), \text{Int}[(a + b*x)^m*\text{Simp}[3*b*c*e*g - a*(d*e*g + c*f*g + c*e*h) + 2*(b*(d*e*g + c*f*g + c*e*h) - a*(d*f*g + d*e*h + c*f*h))*x - (3*a*d*f*h - b*(d*f*g + d*e*h + c*f*h))*x^2, x])/(\text{Sqrt}[c + d*x]*\text{Sqrt}[e + f*x]*\text{Sqrt}[g + h*x]), x], x] /; \text{FreeQ}[\{a, b, c, d, e, f, g, h, m\}, x] \&\& \text{IntegerQ}[2*m] \&\& !\text{LtQ}[m, -1]$

Rule 1602

$\text{Int}[(A_.) + (B_.)*(x_.) + (C_.)*(x_.)^2]/(\text{Sqrt}[(a_.) + (b_.)*(x_.)]*\text{Sqrt}[(c_.) + (d_.)*(x_.)]*\text{Sqrt}[(e_.) + (f_.)*(x_.)]*\text{Sqrt}[(g_.) + (h_.)*(x_.)]), x_Symbol] \rightarrow \text{Simp}[(C*\text{Sqrt}[a + b*x]*\text{Sqrt}[e + f*x]*\text{Sqrt}[g + h*x])/(b*f*h*\text{Sqrt}[c + d*x]), x] + (\text{Dist}[1/(2*b*d*f*h), \text{Int}[(1*\text{Simp}[2*A*b*d*f*h - C*(b*d*e*g + a*c*f*h) + (2*b*B*d*f*h - C*(a*d*f*h + b*(d*f*g + d*e*h + c*f*h)))*x, x])/(\text{Sqrt}[a + b*x]*\text{Sqrt}[c + d*x]*\text{Sqrt}[e + f*x]*\text{Sqrt}[g + h*x]), x], x] + \text{Dist}[(C*(d*e - c*f)*(d*g - c*h))/(2*b*d*f*h), \text{Int}[\text{Sqrt}[a + b*x]/((c + d*x)^{(3/2)}*\text{Sqrt}[e + f*x]*\text{Sqrt}[g + h*x]), x], x]) /; \text{FreeQ}[\{a, b, c, d, e, f, g, h, A, B, C\}, x]$

Rule 1598

$\text{Int}[(A_.) + (B_.)*(x_.)]/(\text{Sqrt}[(a_.) + (b_.)*(x_.)]*\text{Sqrt}[(c_.) + (d_.)*(x_.)]*\text{Sqrt}[(e_.) + (f_.)*(x_.)]*\text{Sqrt}[(g_.) + (h_.)*(x_.)]), x_Symbol] \rightarrow \text{Dist}[(A*b - a*B)/b, \text{Int}[1/(\text{Sqrt}[a + b*x]*\text{Sqrt}[c + d*x]*\text{Sqrt}[e + f*x]*\text{Sqrt}[g + h*x]), x], x] + \text{Dist}[B/b, \text{Int}[\text{Sqrt}[a + b*x]/(\text{Sqrt}[c + d*x]*\text{Sqrt}[e + f*x]*\text{Sqrt}[g + h*x]), x], x] /; \text{FreeQ}[\{a, b, c, d, e, f, g, h, A, B\}, x]$

Rule 170

$\text{Int}[1/(\text{Sqrt}[(a_.) + (b_.)*(x_.)]*\text{Sqrt}[(c_.) + (d_.)*(x_.)]*\text{Sqrt}[(e_.) + (f_.)*(x_.)]*\text{Sqrt}[(g_.) + (h_.)*(x_.)]), x_Symbol] \rightarrow \text{Dist}[(2*\text{Sqrt}[g + h*x]*\text{Sqrt}[(b*e - a*f)*(c + d*x)]/((d*e - c*f)*(a + b*x))]/((f*g - e*h)*\text{Sqrt}[c + d*x]*\text{Sqrt}[-(((b*e - a*f)*(g + h*x))/((f*g - e*h)*(a + b*x)))]), \text{Subst}[\text{Int}[1/(\text{Sqrt}[1 + ((b*c - a*d)*x^2]/(d*e - c*f)]*\text{Sqrt}[1 - ((b*g - a*h)*x^2)/(f*g - e*h)]), x], x, \text{Sqrt}[e + f*x]/\text{Sqrt}[a + b*x]], x] /; \text{FreeQ}[\{a, b, c, d, e, f, g, h\}, x]$

Rule 418

```
Int[1/(Sqrt[(a_) + (b_.)*(x_)^2]*Sqrt[(c_) + (d_.)*(x_)^2]), x_Symbol] := S
imp[(Sqrt[a + b*x^2]*EllipticF[ArcTan[Rt[d/c, 2]*x], 1 - (b*c)/(a*d)]/(a*R
t[d/c, 2]*Sqrt[c + d*x^2]*Sqrt[(c*(a + b*x^2))/(a*(c + d*x^2))]), x] /; Fre
eQ[{a, b, c, d}, x] && PosQ[d/c] && PosQ[b/a] && !SimplerSqrtQ[b/a, d/c]
```

Rule 165

```
Int[Sqrt[(a_.) + (b_.)*(x_)]/(Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(
x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Dist[(2*(a + b*x)*Sqrt[((b*g -
a*h)*(c + d*x))/((d*g - c*h)*(a + b*x))]*Sqrt[((b*g - a*h)*(e + f*x))/((f*
g - e*h)*(a + b*x))])/(Sqrt[c + d*x]*Sqrt[e + f*x]), Subst[Int[1/((h - b*x^
2)*Sqrt[1 + ((b*c - a*d)*x^2)/(d*g - c*h)]*Sqrt[1 + ((b*e - a*f)*x^2)/(f*g
- e*h)]), x], x, Sqrt[g + h*x]/Sqrt[a + b*x]], x] /; FreeQ[{a, b, c, d, e,
f, g, h}, x]
```

Rule 537

```
Int[1/(((a_) + (b_.)*(x_)^2)*Sqrt[(c_) + (d_.)*(x_)^2]*Sqrt[(e_) + (f_.)*(x
_)^2]), x_Symbol] := Simp[(1*EllipticPi[(b*c)/(a*d), ArcSin[Rt[-(d/c), 2]*x
], (c*f)/(d*e)]/(a*Sqrt[c]*Sqrt[e]*Rt[-(d/c), 2]), x] /; FreeQ[{a, b, c, d
, e, f}, x] && !GtQ[d/c, 0] && GtQ[c, 0] && GtQ[e, 0] && !( !GtQ[f/e, 0]
&& SimplerSqrtQ[-(f/e), -(d/c)])]
```

Rule 176

```
Int[Sqrt[(c_.) + (d_.)*(x_)]/(((a_.) + (b_.)*(x_))^(3/2)*Sqrt[(e_.) + (f_.)
*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Dist[(-2*Sqrt[c + d*x]*Sqrt[
-(((b*e - a*f)*(g + h*x))/((f*g - e*h)*(a + b*x)))]/((b*e - a*f)*Sqrt[g +
h*x]*Sqrt[((b*e - a*f)*(c + d*x))/((d*e - c*f)*(a + b*x))]), Subst[Int[Sqrt
[1 + ((b*c - a*d)*x^2)/(d*e - c*f)]/Sqrt[1 - ((b*g - a*h)*x^2)/(f*g - e*h)]
, x], x, Sqrt[e + f*x]/Sqrt[a + b*x]], x] /; FreeQ[{a, b, c, d, e, f, g, h}
, x]
```

Rule 424

```
Int[Sqrt[(a_) + (b_.)*(x_)^2]/Sqrt[(c_) + (d_.)*(x_)^2], x_Symbol] := Simp[
(Sqrt[a]*EllipticE[ArcSin[Rt[-(d/c), 2]*x], (b*c)/(a*d)]/(Sqrt[c]*Rt[-(d/c
), 2]), x] /; FreeQ[{a, b, c, d}, x] && NegQ[d/c] && GtQ[c, 0] && GtQ[a, 0]
```

Rubi steps

$$\begin{aligned}
\int \frac{\sqrt{2-3x}\sqrt{1+4x}\sqrt{7+5x}}{\sqrt{-5+2x}} dx &= \frac{1}{4}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}\sqrt{7+5x} + \frac{1}{8} \int \frac{309-410x-1018x^2}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}\sqrt{7+5x}} dx \\
&= \frac{509\sqrt{2-3x}\sqrt{1+4x}\sqrt{7+5x}}{240\sqrt{-5+2x}} + \frac{1}{4}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}\sqrt{7+5x} - \frac{\int \frac{-320516+2}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}\sqrt{7+5x}}}{192} \\
&= \frac{509\sqrt{2-3x}\sqrt{1+4x}\sqrt{7+5x}}{240\sqrt{-5+2x}} + \frac{1}{4}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}\sqrt{7+5x} + \frac{70919}{14} \int \frac{1}{\sqrt{-5+2x}} \\
&= \frac{509\sqrt{2-3x}\sqrt{1+4x}\sqrt{7+5x}}{240\sqrt{-5+2x}} + \frac{1}{4}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}\sqrt{7+5x} - \frac{509\sqrt{\frac{143}{3}}\sqrt{2-3x}}{3} \\
&= \frac{509\sqrt{2-3x}\sqrt{1+4x}\sqrt{7+5x}}{240\sqrt{-5+2x}} + \frac{1}{4}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}\sqrt{7+5x} - \frac{509\sqrt{\frac{143}{3}}\sqrt{2-3x}}{3}
\end{aligned}$$

Mathematica [A] time = 3.87506, size = 347, normalized size = 0.99

$$\sqrt{2x-5}\sqrt{4x+1}\sqrt{5x+7} \left(66960(2-3x) - \frac{3\left(76756\sqrt{682}\sqrt{\frac{8x^2-18x-5}{(2-3x)^2}}(15x^2+11x-14)\text{EllipticF}\left(\sin^{-1}\left(\sqrt{\frac{31}{39}}\sqrt{\frac{2x-5}{3x-2}}\right), \frac{39}{62}\right)+94674\sqrt{682}(2-3x)(5x+7)\right)}{(2-3x)^2} \right)$$

267840v

Warning: Unable to verify antiderivative.

[In] Integrate[(Sqrt[2 - 3*x]*Sqrt[1 + 4*x]*Sqrt[7 + 5*x])/Sqrt[-5 + 2*x], x]

[Out] (Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*Sqrt[7 + 5*x]*(66960*(2 - 3*x) - (3*(94674*Sqrt[682]*(2 - 3*x)*(7 + 5*x)*Sqrt[(-5 - 18*x + 8*x^2)/(2 - 3*x)^2]*EllipticE[ArcSin[Sqrt[31/39]*Sqrt[(-5 + 2*x)/(-2 + 3*x)]], 39/62] + 76756*Sqrt[682]*Sqrt[(-5 - 18*x + 8*x^2)/(2 - 3*x)^2]*(-14 + 11*x + 15*x^2)*EllipticF[ArcSin[Sqrt[31/39]*Sqrt[(-5 + 2*x)/(-2 + 3*x)]], 39/62] + Sqrt[(7 + 5*x)/(-2 + 3*x)]*(284022*(-35 - 151*x - 34*x^2 + 40*x^3) + 70919*Sqrt[682]*(2 - 3*x)^2*Sqrt[(1 + 4*x)/(-2 + 3*x)]*Sqrt[(-35 - 11*x + 10*x^2)/(2 - 3*x)^2]*EllipticPi[117/62, ArcSin[Sqrt[31/39]*Sqrt[(-5 + 2*x)/(-2 + 3*x)]], 39/62])))/(2 - 3*x)*((7 + 5*x)/(-2 + 3*x))^(3/2)*(5 + 18*x - 8*x^2)))/(267840*Sqrt[2 - 3

*x])

Maple [B] time = 0.019, size = 880, normalized size = 2.5

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] $\int (2-3x)^{1/2} (4x+1)^{1/2} (7+5x)^{1/2} / (2x-5)^{1/2} dx$

[Out]
$$-1/2059200(2-3x)^{1/2}(4x+1)^{1/2}(7+5x)^{1/2}(2x-5)^{1/2}(3622960*11^{1/2}*((7+5x)/(4x+1))^{1/2}*3^{1/2}*13^{1/2}*((2x-5)/(4x+1))^{1/2}*((-2+3x)/(4x+1))^{1/2}*x^2*\text{EllipticF}(1/31*31^{1/2}*11^{1/2}*((7+5x)/(4x+1))^{1/2}, 1/39*31^{1/2}*78^{1/2})-26098192*11^{1/2}*((7+5x)/(4x+1))^{1/2})*3^{1/2}*13^{1/2}*((2x-5)/(4x+1))^{1/2}*((-2+3x)/(4x+1))^{1/2}*x^2*\text{EllipticPi}(1/31*31^{1/2}*11^{1/2}*((7+5x)/(4x+1))^{1/2}, 124/55, 1/39*31^{1/2}*78^{1/2})-34937760*11^{1/2}*((7+5x)/(4x+1))^{1/2}*3^{1/2}*13^{1/2}*((2x-5)/(4x+1))^{1/2}*((-2+3x)/(4x+1))^{1/2}*x^2*\text{EllipticE}(1/31*31^{1/2}*11^{1/2}*((7+5x)/(4x+1))^{1/2}, 1/39*31^{1/2}*78^{1/2})+1811480*11^{1/2}*((7+5x)/(4x+1))^{1/2}*3^{1/2}*13^{1/2}*((2x-5)/(4x+1))^{1/2}*((-2+3x)/(4x+1))^{1/2}*x*\text{EllipticF}(1/31*31^{1/2}*11^{1/2}*((7+5x)/(4x+1))^{1/2}, 1/39*31^{1/2}*78^{1/2})-13049096*11^{1/2}*((7+5x)/(4x+1))^{1/2}*3^{1/2}*13^{1/2}*((2x-5)/(4x+1))^{1/2}*((-2+3x)/(4x+1))^{1/2}*x*\text{EllipticPi}(1/31*31^{1/2}*11^{1/2}*((7+5x)/(4x+1))^{1/2}, 124/55, 1/39*31^{1/2}*78^{1/2})-17468880*11^{1/2}*((7+5x)/(4x+1))^{1/2}*3^{1/2}*13^{1/2}*((2x-5)/(4x+1))^{1/2}*((-2+3x)/(4x+1))^{1/2}*x*\text{EllipticE}(1/31*31^{1/2}*11^{1/2}*((7+5x)/(4x+1))^{1/2}, 1/39*31^{1/2}*78^{1/2})+226435*11^{1/2}*((7+5x)/(4x+1))^{1/2}*3^{1/2}*13^{1/2}*((2x-5)/(4x+1))^{1/2}*((-2+3x)/(4x+1))^{1/2}*\text{EllipticF}(1/31*31^{1/2}*11^{1/2}*((7+5x)/(4x+1))^{1/2}, 1/39*31^{1/2}*78^{1/2})-1631137*11^{1/2}*((7+5x)/(4x+1))^{1/2}*3^{1/2}*13^{1/2}*((2x-5)/(4x+1))^{1/2}*((-2+3x)/(4x+1))^{1/2}*\text{EllipticPi}(1/31*31^{1/2}*11^{1/2}*((7+5x)/(4x+1))^{1/2}, 124/55, 1/39*31^{1/2}*78^{1/2})-2183610*11^{1/2}*((7+5x)/(4x+1))^{1/2}*3^{1/2}*13^{1/2}*((2x-5)/(4x+1))^{1/2}*((-2+3x)/(4x+1))^{1/2}*\text{EllipticE}(1/31*31^{1/2}*11^{1/2}*((7+5x)/(4x+1))^{1/2}, 1/39*31^{1/2}*78^{1/2})-168339600*x^3-61776000*x^4+661123320*x^2+623542920*x-647446800)/(120*x^4-182*x^3-385*x^2+197*x+70)$$

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{5x+7}\sqrt{4x+1}\sqrt{-3x+2}}{\sqrt{2x-5}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2-3*x)^(1/2)*(1+4*x)^(1/2)*(7+5*x)^(1/2)/(-5+2*x)^(1/2),x, algorithm="maxima")

[Out] integrate(sqrt(5*x + 7)*sqrt(4*x + 1)*sqrt(-3*x + 2)/sqrt(2*x - 5), x)

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{5x+7}\sqrt{4x+1}\sqrt{-3x+2}}{\sqrt{2x-5}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2-3*x)^(1/2)*(1+4*x)^(1/2)*(7+5*x)^(1/2)/(-5+2*x)^(1/2),x, algorithm="fricas")

[Out] integral(sqrt(5*x + 7)*sqrt(4*x + 1)*sqrt(-3*x + 2)/sqrt(2*x - 5), x)

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{2-3x}\sqrt{4x+1}\sqrt{5x+7}}{\sqrt{2x-5}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2-3*x)**(1/2)*(1+4*x)**(1/2)*(7+5*x)**(1/2)/(-5+2*x)**(1/2),x)

[Out] Integral(sqrt(2 - 3*x)*sqrt(4*x + 1)*sqrt(5*x + 7)/sqrt(2*x - 5), x)

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{5x+7}\sqrt{4x+1}\sqrt{-3x+2}}{\sqrt{2x-5}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((2-3*x)^(1/2)*(1+4*x)^(1/2)*(7+5*x)^(1/2)/(-5+2*x)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(sqrt(5*x + 7)*sqrt(4*x + 1)*sqrt(-3*x + 2)/sqrt(2*x - 5), x)
```

$$3.88 \quad \int \frac{\sqrt{2-3x}\sqrt{1+4x}}{\sqrt{-5+2x}\sqrt{7+5x}} dx$$

Optimal. Leaf size=365

$$\frac{7\sqrt{\frac{11}{23}}\sqrt{5x+7}\text{EllipticF}\left(\tan^{-1}\left(\frac{\sqrt{4x+1}}{\sqrt{2}\sqrt{2-3x}}\right), -\frac{39}{23}\right)}{10\sqrt{2x-5}\sqrt{\frac{5x+7}{5-2x}}} + \frac{41\sqrt{\frac{11}{62}}\sqrt{2-3x}\text{EllipticF}\left(\tan^{-1}\left(\frac{\sqrt{\frac{22}{23}}\sqrt{5x+7}}{\sqrt{2x-5}}\right), \frac{39}{62}\right)}{20\sqrt{-\frac{2-3x}{4x+1}}\sqrt{4x+1}} + \frac{\sqrt{2-3x}\sqrt{4x+1}}{5\sqrt{2x-5}}$$

[Out] (Sqrt[2 - 3*x]*Sqrt[1 + 4*x]*Sqrt[7 + 5*x])/(5*Sqrt[-5 + 2*x]) - (Sqrt[429]*Sqrt[2 - 3*x]*Sqrt[(7 + 5*x)/(5 - 2*x)]*EllipticE[ArcSin[(Sqrt[39/23]*Sqrt[1 + 4*x])/Sqrt[-5 + 2*x]], -23/39])/(10*Sqrt[(2 - 3*x)/(5 - 2*x)]*Sqrt[7 + 5*x]) + (7*Sqrt[11/23]*Sqrt[7 + 5*x]*EllipticF[ArcTan[Sqrt[1 + 4*x]/(Sqrt[2]*Sqrt[2 - 3*x])], -39/23])/(10*Sqrt[-5 + 2*x]*Sqrt[(7 + 5*x)/(5 - 2*x)]) + (41*Sqrt[11/62]*Sqrt[2 - 3*x]*EllipticF[ArcTan[(Sqrt[22/23]*Sqrt[7 + 5*x])/Sqrt[-5 + 2*x]], 39/62])/(20*Sqrt[-((2 - 3*x)/(1 + 4*x))]*Sqrt[1 + 4*x]) + (943*Sqrt[2 - 3*x]*EllipticPi[78/55, ArcTan[(Sqrt[22/23]*Sqrt[7 + 5*x])/Sqrt[-5 + 2*x]], 39/62])/(100*Sqrt[682]*Sqrt[-((2 - 3*x)/(1 + 4*x))]*Sqrt[1 + 4*x])

Rubi [A] time = 0.216143, antiderivative size = 365, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 8, integrand size = 37, $\frac{\text{number of rules}}{\text{integrand size}} = 0.216$, Rules used = {173, 176, 424, 170, 418, 165, 536, 539}

$$\frac{\sqrt{2-3x}\sqrt{4x+1}\sqrt{5x+7}}{5\sqrt{2x-5}} + \frac{7\sqrt{\frac{11}{23}}\sqrt{5x+7}F\left(\tan^{-1}\left(\frac{\sqrt{4x+1}}{\sqrt{2}\sqrt{2-3x}}\right)\middle| -\frac{39}{23}\right)}{10\sqrt{2x-5}\sqrt{\frac{5x+7}{5-2x}}} + \frac{41\sqrt{\frac{11}{62}}\sqrt{2-3x}F\left(\tan^{-1}\left(\frac{\sqrt{\frac{22}{23}}\sqrt{5x+7}}{\sqrt{2x-5}}\right)\middle| \frac{39}{62}\right)}{20\sqrt{-\frac{2-3x}{4x+1}}\sqrt{4x+1}} - \frac{\sqrt{429}}{5\sqrt{2x-5}}$$

Antiderivative was successfully verified.

[In] Int[(Sqrt[2 - 3*x]*Sqrt[1 + 4*x])/(Sqrt[-5 + 2*x]*Sqrt[7 + 5*x]), x]

[Out] (Sqrt[2 - 3*x]*Sqrt[1 + 4*x]*Sqrt[7 + 5*x])/(5*Sqrt[-5 + 2*x]) - (Sqrt[429]*Sqrt[2 - 3*x]*Sqrt[(7 + 5*x)/(5 - 2*x)]*EllipticE[ArcSin[(Sqrt[39/23]*Sqrt[1 + 4*x])/Sqrt[-5 + 2*x]], -23/39])/(10*Sqrt[(2 - 3*x)/(5 - 2*x)]*Sqrt[7 + 5*x]) + (7*Sqrt[11/23]*Sqrt[7 + 5*x]*EllipticF[ArcTan[Sqrt[1 + 4*x]/(Sqrt[2]*Sqrt[2 - 3*x])], -39/23])/(10*Sqrt[-5 + 2*x]*Sqrt[(7 + 5*x)/(5 - 2*x)]) + (41*Sqrt[11/62]*Sqrt[2 - 3*x]*EllipticF[ArcTan[(Sqrt[22/23]*Sqrt[7 + 5*x])/Sqrt[-5 + 2*x]], 39/62])/(20*Sqrt[-((2 - 3*x)/(1 + 4*x))]*Sqrt[1 + 4*x]) + (943*Sqrt[2 - 3*x]*EllipticPi[78/55, ArcTan[(Sqrt[22/23]*Sqrt[7 + 5*x])/Sqrt[-5 + 2*x]], 39/62])/(100*Sqrt[682]*Sqrt[-((2 - 3*x)/(1 + 4*x))]*Sqrt[1 + 4*x])

qrt[-5 + 2*x]], 39/62]]/(100*Sqrt[682]*Sqrt[-((2 - 3*x)/(1 + 4*x))]*Sqrt[1 + 4*x])

Rule 173

Int[(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)])/(Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Simp[(Sqrt[a + b*x]*Sqrt[c + d*x]*Sqrt[g + h*x])/(h*Sqrt[e + f*x]), x] + (-Dist[((d*e - c*f)*(f*g - e*h))/(2*f*h), Int[Sqrt[a + b*x]/(Sqrt[c + d*x]*(e + f*x)^(3/2)*Sqrt[g + h*x]), x], x] + Dist[((d*e - c*f)*(b*f*g + b*e*h - 2*a*f*h))/(2*f^2*h), Int[1/(Sqrt[a + b*x]*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]), x], x] + Dist[(a*d*f*h - b*(d*f*g + d*e*h - c*f*h))/(2*f^2*h), Int[Sqrt[e + f*x]/(Sqrt[a + b*x]*Sqrt[c + d*x]*Sqrt[g + h*x]), x], x]) /; FreeQ[{a, b, c, d, e, f, g, h}, x]

Rule 176

Int[Sqrt[(c_.) + (d_.)*(x_)]/(((a_.) + (b_.)*(x_))^(3/2)*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Dist[(-2*Sqrt[c + d*x]*Sqrt[-(((b*e - a*f)*(g + h*x))/((f*g - e*h)*(a + b*x)))]/((b*e - a*f)*Sqrt[g + h*x]*Sqrt[((b*e - a*f)*(c + d*x))/((d*e - c*f)*(a + b*x))]), Subst[Int[Sqrt[1 + ((b*c - a*d)*x^2)/(d*e - c*f)]/Sqrt[1 - ((b*g - a*h)*x^2)/(f*g - e*h)], x], x, Sqrt[e + f*x]/Sqrt[a + b*x]], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x]

Rule 424

Int[Sqrt[(a_) + (b_.)*(x_)^2]/Sqrt[(c_) + (d_.)*(x_)^2], x_Symbol] := Simp[(Sqrt[a]*EllipticE[ArcSin[Rt[-(d/c), 2]*x], (b*c)/(a*d)]/(Sqrt[c]*Rt[-(d/c), 2]), x] /; FreeQ[{a, b, c, d}, x] && NegQ[d/c] && GtQ[c, 0] && GtQ[a, 0]

Rule 170

Int[1/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Dist[(2*Sqrt[g + h*x]*Sqrt[((b*e - a*f)*(c + d*x))/((d*e - c*f)*(a + b*x)))]/((f*g - e*h)*Sqrt[c + d*x]*Sqrt[-(((b*e - a*f)*(g + h*x))/((f*g - e*h)*(a + b*x)))]), Subst[Int[1/(Sqrt[1 + ((b*c - a*d)*x^2)/(d*e - c*f)]*Sqrt[1 - ((b*g - a*h)*x^2)/(f*g - e*h)]), x], x, Sqrt[e + f*x]/Sqrt[a + b*x]], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x]

Rule 418

Int[1/(Sqrt[(a_) + (b_.)*(x_)^2]*Sqrt[(c_) + (d_.)*(x_)^2]), x_Symbol] := Simp[(Sqrt[a + b*x^2]*EllipticF[ArcTan[Rt[d/c, 2]*x], 1 - (b*c)/(a*d)]/(a*R

$\text{t}[d/c, 2] * \text{Sqrt}[c + d*x^2] * \text{Sqrt}[(c*(a + b*x^2))/(a*(c + d*x^2))], x] /;$ FreeQ[{a, b, c, d}, x] && PosQ[d/c] && PosQ[b/a] && !SimplerSqrtQ[b/a, d/c]

Rule 165

$\text{Int}[\text{Sqrt}[(a_.) + (b_.)*(x_.)]/(\text{Sqrt}[(c_.) + (d_.)*(x_.)] * \text{Sqrt}[(e_.) + (f_.)*(x_.)] * \text{Sqrt}[(g_.) + (h_.)*(x_.)]), x_Symbol] \rightarrow \text{Dist}[(2*(a + b*x) * \text{Sqrt}[(b*g - a*h)*(c + d*x)]/((d*g - c*h)*(a + b*x))] * \text{Sqrt}[(b*g - a*h)*(e + f*x)]/((f*g - e*h)*(a + b*x))]/(\text{Sqrt}[c + d*x] * \text{Sqrt}[e + f*x]), \text{Subst}[\text{Int}[1/((h - b*x^2) * \text{Sqrt}[1 + ((b*c - a*d)*x^2)/(d*g - c*h)] * \text{Sqrt}[1 + ((b*e - a*f)*x^2)/(f*g - e*h)]), x], x, \text{Sqrt}[g + h*x]/\text{Sqrt}[a + b*x]], x] /;$ FreeQ[{a, b, c, d, e, f, g, h}, x]

Rule 536

$\text{Int}[1/(((a_.) + (b_.)*(x_.)^2) * \text{Sqrt}[(c_.) + (d_.)*(x_.)^2] * \text{Sqrt}[(e_.) + (f_.)*(x_.)^2]), x_Symbol] \rightarrow -\text{Dist}[f/(b*e - a*f), \text{Int}[1/(\text{Sqrt}[c + d*x^2] * \text{Sqrt}[e + f*x^2]), x], x] + \text{Dist}[b/(b*e - a*f), \text{Int}[\text{Sqrt}[e + f*x^2]/((a + b*x^2) * \text{Sqrt}[c + d*x^2]), x], x] /;$ FreeQ[{a, b, c, d, e, f}, x] && GtQ[d/c, 0] && GtQ[f/e, 0] && !SimplerSqrtQ[d/c, f/e]

Rule 539

$\text{Int}[\text{Sqrt}[(c_.) + (d_.)*(x_.)^2]/(((a_.) + (b_.)*(x_.)^2) * \text{Sqrt}[(e_.) + (f_.)*(x_.)^2]), x_Symbol] \rightarrow \text{Simp}[(c * \text{Sqrt}[e + f*x^2] * \text{EllipticPi}[1 - (b*c)/(a*d), \text{ArcTan}[\text{Rt}[d/c, 2]*x], 1 - (c*f)/(d*e)])/(a*e * \text{Rt}[d/c, 2] * \text{Sqrt}[c + d*x^2] * \text{Sqrt}[(c*(e + f*x^2))/(e*(c + d*x^2))]), x] /;$ FreeQ[{a, b, c, d, e, f}, x] && PosQ[d/c]

Rubi steps

$$\begin{aligned}
\int \frac{\sqrt{2-3x}\sqrt{1+4x}}{\sqrt{-5+2x}\sqrt{7+5x}} dx &= \frac{\sqrt{2-3x}\sqrt{1+4x}\sqrt{7+5x}}{5\sqrt{-5+2x}} - \frac{41}{20} \int \frac{\sqrt{-5+2x}}{\sqrt{2-3x}\sqrt{1+4x}\sqrt{7+5x}} dx + \frac{77}{20} \int \frac{1}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{7+5x}} dx \\
&= \frac{\sqrt{2-3x}\sqrt{1+4x}\sqrt{7+5x}}{5\sqrt{-5+2x}} - \frac{(1599\sqrt{-\frac{2-3x}{-5+2x}}(-5+2x)\sqrt{\frac{1+4x}{-5+2x}}) \text{Subst} \left(\int \frac{1}{(5-2x^2)\sqrt{1+\frac{11x^2}{31}}\sqrt{1+\frac{2x}{7}}} dx \right)}{10\sqrt{713}\sqrt{2-3x}\sqrt{1+4x}} \\
&= \frac{\sqrt{2-3x}\sqrt{1+4x}\sqrt{7+5x}}{5\sqrt{-5+2x}} - \frac{\sqrt{429}\sqrt{2-3x}\sqrt{\frac{7+5x}{5-2x}} E \left(\sin^{-1} \left(\frac{\sqrt{\frac{39}{23}}\sqrt{1+4x}}{\sqrt{-5+2x}} \right) \middle| -\frac{23}{39} \right)}{10\sqrt{\frac{2-3x}{5-2x}}\sqrt{7+5x}} + \frac{7\sqrt{\frac{11}{23}}\sqrt{7+5x}}{10\sqrt{\frac{2-3x}{5-2x}}\sqrt{7+5x}} \\
&= \frac{\sqrt{2-3x}\sqrt{1+4x}\sqrt{7+5x}}{5\sqrt{-5+2x}} - \frac{\sqrt{429}\sqrt{2-3x}\sqrt{\frac{7+5x}{5-2x}} E \left(\sin^{-1} \left(\frac{\sqrt{\frac{39}{23}}\sqrt{1+4x}}{\sqrt{-5+2x}} \right) \middle| -\frac{23}{39} \right)}{10\sqrt{\frac{2-3x}{5-2x}}\sqrt{7+5x}} + \frac{7\sqrt{\frac{11}{23}}\sqrt{7+5x}}{10\sqrt{\frac{2-3x}{5-2x}}\sqrt{7+5x}}
\end{aligned}$$

Mathematica [A] time = 1.22962, size = 318, normalized size = 0.87

$$\frac{\sqrt{2-3x} \left(1984\sqrt{682}\sqrt{\frac{5-2x}{5x+7}}\sqrt{\frac{4x+1}{5x+7}}(15x^2+11x-14) \text{EllipticF} \left(\sin^{-1} \left(\sqrt{\frac{155-62x}{55x+77}} \right), \frac{23}{62} \right) - 3410\sqrt{682}\sqrt{\frac{5-2x}{5x+7}}\sqrt{\frac{4x+1}{5x+7}}(15x^2 - \right.$$

3410

Warning: Unable to verify antiderivative.

[In] Integrate[(Sqrt[2 - 3*x]*Sqrt[1 + 4*x])/(Sqrt[-5 + 2*x]*Sqrt[7 + 5*x]),x]

[Out] (Sqrt[2 - 3*x]*(-3410*Sqrt[682]*Sqrt[(5 - 2*x)/(7 + 5*x)]*Sqrt[(1 + 4*x)/(7 + 5*x)]*(-14 + 11*x + 15*x^2)*EllipticE[ArcSin[Sqrt[(155 - 62*x)/(77 + 55*x)]], 23/62] + 1984*Sqrt[682]*Sqrt[(5 - 2*x)/(7 + 5*x)]*Sqrt[(1 + 4*x)/(7 + 5*x)]*(-14 + 11*x + 15*x^2)*EllipticF[ArcSin[Sqrt[(155 - 62*x)/(77 + 55*x)]], 23/62] + Sqrt[(-2 + 3*x)/(7 + 5*x)]*(17050*(10 + 21*x - 70*x^2 + 24*x^3) - 1599*Sqrt[682]*Sqrt[(1 + 4*x)/(7 + 5*x)]*(7 + 5*x)^2*Sqrt[(-10 + 19*x - 6*x^2)/(7 + 5*x)^2]*EllipticPi[-55/62, ArcSin[Sqrt[(155 - 62*x)/(77 + 55*x)]]], 23/62)))/(34100*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*((-2 + 3*x)/(7 + 5*x))^(3/2)*(7 + 5*x)^(3/2))

Maple [A] time = 0.021, size = 875, normalized size = 2.4

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] $\text{int}((2-3*x)^{(1/2)}*(4*x+1)^{(1/2)}/(7+5*x)^{(1/2)}/(2*x-5)^{(1/2)}, x)$

[Out] $1/42900*(2-3*x)^{(1/2)}*(4*x+1)^{(1/2)}*(7+5*x)^{(1/2)}*(2*x-5)^{(1/2)}*(15088*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}*3^{(1/2)}*13^{(1/2)}*((2*x-5)/(4*x+1))^{(1/2)}*((-2+3*x)/(4*x+1))^{(1/2)}*x^2*\text{EllipticPi}(1/31*31^{(1/2)}*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}, 124/55, 1/39*31^{(1/2)}*78^{(1/2)})+68640*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}*3^{(1/2)}*13^{(1/2)}*((2*x-5)/(4*x+1))^{(1/2)}*((-2+3*x)/(4*x+1))^{(1/2)}*x^2*\text{EllipticE}(1/31*31^{(1/2)}*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}, 1/39*31^{(1/2)}*78^{(1/2)})-20240*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}*3^{(1/2)}*13^{(1/2)}*((2*x-5)/(4*x+1))^{(1/2)}*((-2+3*x)/(4*x+1))^{(1/2)}*x^2*\text{EllipticF}(1/31*31^{(1/2)}*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}, 1/39*31^{(1/2)}*78^{(1/2)})+7544*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}*3^{(1/2)}*13^{(1/2)}*((2*x-5)/(4*x+1))^{(1/2)}*((-2+3*x)/(4*x+1))^{(1/2)}*x*\text{EllipticPi}(1/31*31^{(1/2)}*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}, 124/55, 1/39*31^{(1/2)}*78^{(1/2)})+34320*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}*3^{(1/2)}*13^{(1/2)}*((2*x-5)/(4*x+1))^{(1/2)}*((-2+3*x)/(4*x+1))^{(1/2)}*x*\text{EllipticE}(1/31*31^{(1/2)}*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}, 1/39*31^{(1/2)}*78^{(1/2)})-10120*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}*3^{(1/2)}*13^{(1/2)}*((2*x-5)/(4*x+1))^{(1/2)}*((-2+3*x)/(4*x+1))^{(1/2)}*x*\text{EllipticF}(1/31*31^{(1/2)}*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}, 1/39*31^{(1/2)}*78^{(1/2)})+943*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}*3^{(1/2)}*13^{(1/2)}*((2*x-5)/(4*x+1))^{(1/2)}*((-2+3*x)/(4*x+1))^{(1/2)}*\text{EllipticPi}(1/31*31^{(1/2)}*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}, 124/55, 1/39*31^{(1/2)}*78^{(1/2)})+4290*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}*3^{(1/2)}*13^{(1/2)}*((2*x-5)/(4*x+1))^{(1/2)}*((-2+3*x)/(4*x+1))^{(1/2)}*\text{EllipticE}(1/31*31^{(1/2)}*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}, 1/39*31^{(1/2)}*78^{(1/2)})-1265*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}*3^{(1/2)}*13^{(1/2)}*((2*x-5)/(4*x+1))^{(1/2)}*((-2+3*x)/(4*x+1))^{(1/2)}*\text{EllipticF}(1/31*31^{(1/2)}*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}, 1/39*31^{(1/2)}*78^{(1/2)})+514800*x^3-909480*x^2-1424280*x+1201200)/(120*x^4-182*x^3-385*x^2+197*x+70)$

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{4x+1}\sqrt{-3x+2}}{\sqrt{5x+7}\sqrt{2x-5}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2-3*x)^(1/2)*(1+4*x)^(1/2)/(7+5*x)^(1/2)/(-5+2*x)^(1/2),x, algorith="maxima")

[Out] integrate(sqrt(4*x + 1)*sqrt(-3*x + 2)/(sqrt(5*x + 7)*sqrt(2*x - 5)), x)

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{5x+7}\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2}}{10x^2-11x-35}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2-3*x)^(1/2)*(1+4*x)^(1/2)/(7+5*x)^(1/2)/(-5+2*x)^(1/2),x, algorith="fricas")

[Out] integral(sqrt(5*x + 7)*sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)/(10*x^2 - 11*x - 35), x)

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{2-3x}\sqrt{4x+1}}{\sqrt{2x-5}\sqrt{5x+7}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2-3*x)**(1/2)*(1+4*x)**(1/2)/(7+5*x)**(1/2)/(-5+2*x)**(1/2),x)

[Out] Integral(sqrt(2 - 3*x)*sqrt(4*x + 1)/(sqrt(2*x - 5)*sqrt(5*x + 7)), x)

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{4x+1}\sqrt{-3x+2}}{\sqrt{5x+7}\sqrt{2x-5}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((2-3*x)^(1/2)*(1+4*x)^(1/2)/(7+5*x)^(1/2)/(-5+2*x)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(sqrt(4*x + 1)*sqrt(-3*x + 2)/(sqrt(5*x + 7)*sqrt(2*x - 5)), x)
```

$$3.89 \quad \int \frac{\sqrt{2-3x}\sqrt{1+4x}}{\sqrt{-5+2x}(7+5x)^{3/2}} dx$$

Optimal. Leaf size=279

$$-\frac{4\sqrt{2-3x}\sqrt{4x+1}\sqrt{5x+7}}{195\sqrt{2x-5}} + \frac{2\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}}{39\sqrt{5x+7}} + \frac{2\sqrt{\frac{11}{39}}\sqrt{2-3x}\sqrt{\frac{5x+7}{5-2x}}E\left(\sin^{-1}\left(\frac{\sqrt{\frac{39}{23}}\sqrt{4x+1}}{\sqrt{2x-5}}\right)\middle|-\frac{23}{39}\right)}{5\sqrt{\frac{2-3x}{5-2x}}\sqrt{5x+7}} - \frac{69\sqrt{\frac{2}{341}}}{1}$$

```
[Out] (2*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/(39*Sqrt[7 + 5*x]) - (4*Sqrt[2 - 3*x]*Sqrt[1 + 4*x]*Sqrt[7 + 5*x])/(195*Sqrt[-5 + 2*x]) + (2*Sqrt[11/39]*Sqrt[2 - 3*x]*Sqrt[(7 + 5*x)/(5 - 2*x)]*EllipticE[ArcSin[(Sqrt[39/23]*Sqrt[1 + 4*x])/Sqrt[-5 + 2*x]], -23/39])/(5*Sqrt[(2 - 3*x)/(5 - 2*x)]*Sqrt[7 + 5*x]) - (69*Sqrt[2/341]*Sqrt[-((2 - 3*x)/(1 + 4*x))]*Sqrt[-((5 - 2*x)/(1 + 4*x))])*(1 + 4*x)*EllipticPi[78/55, ArcSin[(Sqrt[22/39]*Sqrt[7 + 5*x])/Sqrt[1 + 4*x]], 39/62])/(25*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x])
```

Rubi [A] time = 0.194712, antiderivative size = 279, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 37, $\frac{\text{number of rules}}{\text{integrand size}} = 0.189$, Rules used = {164, 1586, 1595, 165, 537, 176, 424}

$$-\frac{4\sqrt{2-3x}\sqrt{4x+1}\sqrt{5x+7}}{195\sqrt{2x-5}} + \frac{2\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}}{39\sqrt{5x+7}} + \frac{2\sqrt{\frac{11}{39}}\sqrt{2-3x}\sqrt{\frac{5x+7}{5-2x}}E\left(\sin^{-1}\left(\frac{\sqrt{\frac{39}{23}}\sqrt{4x+1}}{\sqrt{2x-5}}\right)\middle|-\frac{23}{39}\right)}{5\sqrt{\frac{2-3x}{5-2x}}\sqrt{5x+7}} - \frac{69\sqrt{\frac{2}{341}}}{1}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[2 - 3*x]*Sqrt[1 + 4*x])/(Sqrt[-5 + 2*x]*(7 + 5*x)^(3/2)),x]
```

```
[Out] (2*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/(39*Sqrt[7 + 5*x]) - (4*Sqrt[2 - 3*x]*Sqrt[1 + 4*x]*Sqrt[7 + 5*x])/(195*Sqrt[-5 + 2*x]) + (2*Sqrt[11/39]*Sqrt[2 - 3*x]*Sqrt[(7 + 5*x)/(5 - 2*x)]*EllipticE[ArcSin[(Sqrt[39/23]*Sqrt[1 + 4*x])/Sqrt[-5 + 2*x]], -23/39])/(5*Sqrt[(2 - 3*x)/(5 - 2*x)]*Sqrt[7 + 5*x]) - (69*Sqrt[2/341]*Sqrt[-((2 - 3*x)/(1 + 4*x))]*Sqrt[-((5 - 2*x)/(1 + 4*x))])*(1 + 4*x)*EllipticPi[78/55, ArcSin[(Sqrt[22/39]*Sqrt[7 + 5*x])/Sqrt[1 + 4*x]], 39/62])/(25*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x])
```

Rule 164

```
Int[(((a_.) + (b_.)*(x_))^(m_)*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*
(x_)])/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] := Simp[((a + b*x)^(m + 1)*Sqrt[
c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/((m + 1)*(b*c - a*d)), x] - Dist[1/(2
*(m + 1)*(b*c - a*d)), Int[((a + b*x)^(m + 1)/(Sqrt[c + d*x]*Sqrt[e + f*x]*
Sqrt[g + h*x]))*Simp[c*(f*g + e*h) + d*e*g*(2*m + 3) + 2*(c*f*h + d*(m + 2)
*(f*g + e*h))*x + d*f*h*(2*m + 5)*x^2, x], x] /; FreeQ[{a, b, c, d, e,
f, g, h, m}, x] && IntegerQ[2*m] && LtQ[m, -1]
```

Rule 1586

```
Int[(u_.)*(Px_)^(p_.)*(Qx_)^(q_.), x_Symbol] := Int[u*PolynomialQuotient[Px
, Qx, x]^p*Qx^(p + q), x] /; FreeQ[q, x] && PolyQ[Px, x] && PolyQ[Qx, x] &&
EqQ[PolynomialRemainder[Px, Qx, x], 0] && IntegerQ[p] && LtQ[p*q, 0]
```

Rule 1595

```
Int[(Sqrt[(a_.) + (b_.)*(x_)]*((A_.) + (B_.)*(x_)))/(Sqrt[(c_.) + (d_.)*(x_
)]*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Simp[(b
*B*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/((d*f*h*Sqrt[a + b*x]), x] + (
-Dist[(B*(b*g - a*h))/(2*f*h), Int[Sqrt[e + f*x]/(Sqrt[a + b*x]*Sqrt[c + d*
x]*Sqrt[g + h*x]), x], x] + Dist[(B*(b*e - a*f)*(b*g - a*h))/(2*d*f*h), Int
[Sqrt[c + d*x]/((a + b*x)^(3/2)*Sqrt[e + f*x]*Sqrt[g + h*x]), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, g, h, A, B}, x] && EqQ[2*A*d*f - B*(d*e + c*f), 0]
```

Rule 165

```
Int[Sqrt[(a_.) + (b_.)*(x_)]/(Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(
x_)])*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Dist[(2*(a + b*x)*Sqrt[((b*g -
a*h)*(c + d*x))/((d*g - c*h)*(a + b*x))]*Sqrt[((b*g - a*h)*(e + f*x))/((f*
g - e*h)*(a + b*x))])/(Sqrt[c + d*x]*Sqrt[e + f*x]), Subst[Int[1/((h - b*x^
2)*Sqrt[1 + ((b*c - a*d)*x^2)/(d*g - c*h)]*Sqrt[1 + ((b*e - a*f)*x^2)/(f*g
- e*h)]], x], x, Sqrt[g + h*x]/Sqrt[a + b*x]], x] /; FreeQ[{a, b, c, d, e,
f, g, h}, x]
```

Rule 537

```
Int[1/(((a_) + (b_.)*(x_)^2)*Sqrt[(c_) + (d_.)*(x_)^2]*Sqrt[(e_) + (f_.)*(x
_)^2]), x_Symbol] := Simp[(1*EllipticPi[(b*c)/(a*d), ArcSin[Rt[-(d/c), 2]*x
], (c*f)/(d*e))]/(a*Sqrt[c]*Sqrt[e]*Rt[-(d/c), 2]), x] /; FreeQ[{a, b, c, d
, e, f}, x] && !GtQ[d/c, 0] && GtQ[c, 0] && GtQ[e, 0] && !( !GtQ[f/e, 0]
&& SimplerSqrtQ[-(f/e), -(d/c)])
```

Rule 176

```
Int[Sqrt[(c_.) + (d_.)*(x_)]/(((a_.) + (b_.)*(x_)^(3/2)*Sqrt[(e_.) + (f_.)
```

```

*(x_)]*Sqrt[(g_.) + (h_.)*(x_)], x_Symbol] := Dist[(-2*Sqrt[c + d*x]*Sqrt[
-(((b*e - a*f)*(g + h*x))/((f*g - e*h)*(a + b*x))))]/((b*e - a*f)*Sqrt[g +
h*x]*Sqrt[((b*e - a*f)*(c + d*x))/((d*e - c*f)*(a + b*x))]), Subst[Int[Sqrt
[1 + ((b*c - a*d)*x^2)/(d*e - c*f)]/Sqrt[1 - ((b*g - a*h)*x^2)/(f*g - e*h)]
, x], x, Sqrt[e + f*x]/Sqrt[a + b*x]], x] /; FreeQ[{a, b, c, d, e, f, g, h}
, x]

```

Rule 424

```

Int[Sqrt[(a_) + (b_.)*(x_)^2]/Sqrt[(c_) + (d_.)*(x_)^2], x_Symbol] := Simp[
(Sqrt[a]*EllipticE[ArcSin[Rt[-(d/c), 2]*x], (b*c)/(a*d)]/(Sqrt[c]*Rt[-(d/c
), 2]), x] /; FreeQ[{a, b, c, d}, x] && NegQ[d/c] && GtQ[c, 0] && GtQ[a, 0]

```

Rubi steps

$$\begin{aligned}
\int \frac{\sqrt{2-3x}\sqrt{1+4x}}{\sqrt{-5+2x}(7+5x)^{3/2}} dx &= \frac{2\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{39\sqrt{7+5x}} - \frac{1}{39} \int \frac{-25+130x-48x^2}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}\sqrt{7+5x}} dx \\
&= \frac{2\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{39\sqrt{7+5x}} - \frac{1}{39} \int \frac{(5-24x)\sqrt{-5+2x}}{\sqrt{2-3x}\sqrt{1+4x}\sqrt{7+5x}} dx \\
&= \frac{2\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{39\sqrt{7+5x}} - \frac{4\sqrt{2-3x}\sqrt{1+4x}\sqrt{7+5x}}{195\sqrt{-5+2x}} - \frac{3}{5} \int \frac{\sqrt{1+4x}}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{7+5x}} dx \\
&= \frac{2\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{39\sqrt{7+5x}} - \frac{4\sqrt{2-3x}\sqrt{1+4x}\sqrt{7+5x}}{195\sqrt{-5+2x}} - \frac{(46\sqrt{\frac{3}{403}}\sqrt{\frac{2-3x}{1+4x}}\sqrt{\frac{-5+2x}{1+4x}}(1 + \dots))}{5\sqrt{2-3x}\sqrt{-5+2x}\sqrt{7+5x}} \\
&= \frac{2\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{39\sqrt{7+5x}} - \frac{4\sqrt{2-3x}\sqrt{1+4x}\sqrt{7+5x}}{195\sqrt{-5+2x}} + \frac{2\sqrt{\frac{11}{39}}\sqrt{2-3x}\sqrt{\frac{7+5x}{5-2x}}E\left(\sin^{-1}\left(\frac{\sqrt{2-3x}\sqrt{1+4x}}{\sqrt{5-2x}\sqrt{7+5x}}\right)\right)}{5\sqrt{2-3x}\sqrt{-5+2x}\sqrt{7+5x}}
\end{aligned}$$

Mathematica [A] time = 2.29731, size = 326, normalized size = 1.17

$$\frac{\sqrt{2x-5}\sqrt{4x+1} \left(23\sqrt{682}\sqrt{\frac{8x^2-18x-5}{(2-3x)^2}} (15x^2+11x-14) \operatorname{EllipticF}\left(\sin^{-1}\left(\sqrt{\frac{31}{39}}\sqrt{\frac{2x-5}{3x-2}}\right), \frac{39}{62}\right) - 62\sqrt{682}\sqrt{\frac{8x^2-18x-5}{(2-3x)^2}} (15x^2 + \dots) \right)}{6045\sqrt{2-3x}}$$

Warning: Unable to verify antiderivative.

$\frac{1}{2} * ((-2+3*x)/(4*x+1))^{(1/2)} * \text{EllipticE}(1/31*31^{(1/2)}*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}, 1/39*31^{(1/2)}*78^{(1/2)}) - 7590*x^2 + 24035*x - 12650 / (120*x^4 - 182*x^3 - 385*x^2 + 197*x + 70)$

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{4x+1}\sqrt{-3x+2}}{(5x+7)^{\frac{3}{2}}\sqrt{2x-5}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2-3*x)^(1/2)*(1+4*x)^(1/2)/(7+5*x)^(3/2)/(-5+2*x)^(1/2), x, algorithm="maxima")

[Out] integrate(sqrt(4*x + 1)*sqrt(-3*x + 2)/((5*x + 7)^(3/2)*sqrt(2*x - 5)), x)

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{5x+7}\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2}}{50x^3+15x^2-252x-245}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2-3*x)^(1/2)*(1+4*x)^(1/2)/(7+5*x)^(3/2)/(-5+2*x)^(1/2), x, algorithm="fricas")

[Out] integral(sqrt(5*x + 7)*sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)/(50*x^3 + 15*x^2 - 252*x - 245), x)

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2-3*x)**(1/2)*(1+4*x)**(1/2)/(7+5*x)**(3/2)/(-5+2*x)**(1/2), x)

[Out] Timed out

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{4x+1}\sqrt{-3x+2}}{(5x+7)^{\frac{3}{2}}\sqrt{2x-5}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2-3*x)^(1/2)*(1+4*x)^(1/2)/(7+5*x)^(3/2)/(-5+2*x)^(1/2),x, algorithm="giac")

[Out] integrate(sqrt(4*x + 1)*sqrt(-3*x + 2)/((5*x + 7)^(3/2)*sqrt(2*x - 5)), x)

$$3.90 \quad \int \frac{\sqrt{2-3x}\sqrt{1+4x}}{\sqrt{-5+2x}(7+5x)^{5/2}} dx$$

Optimal. Leaf size=290

$$\frac{44\sqrt{\frac{11}{23}}\sqrt{5x+7}\text{EllipticF}\left(\tan^{-1}\left(\frac{\sqrt{4x+1}}{\sqrt{2}\sqrt{2-3x}}\right), -\frac{39}{23}\right)}{2691\sqrt{2x-5}\sqrt{\frac{5x+7}{5-2x}}} + \frac{3740\sqrt{2-3x}\sqrt{4x+1}\sqrt{5x+7}}{3253419\sqrt{2x-5}} - \frac{9350\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}}{3253419\sqrt{5x+7}} +$$

```
[Out] (2*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/((117*(7 + 5*x)^(3/2)) - (9350*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/(3253419*Sqrt[7 + 5*x])) + (3740*Sqrt[2 - 3*x]*Sqrt[1 + 4*x]*Sqrt[7 + 5*x])/(3253419*Sqrt[-5 + 2*x]) - (1870*Sqrt[11/39]*Sqrt[2 - 3*x]*Sqrt[(7 + 5*x)/(5 - 2*x)]*EllipticE[ArcSin[(Sqrt[39/23]*Sqrt[1 + 4*x])/Sqrt[-5 + 2*x]], -23/39])/(83421*Sqrt[(2 - 3*x)/(5 - 2*x)]*Sqrt[7 + 5*x]) + (44*Sqrt[11/23]*Sqrt[7 + 5*x]*EllipticF[ArcTan[Sqrt[1 + 4*x]/(Sqrt[2]*Sqrt[2 - 3*x])], -39/23])/(2691*Sqrt[-5 + 2*x]*Sqrt[(7 + 5*x)/(5 - 2*x)])
```

Rubi [A] time = 0.319986, antiderivative size = 290, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 8, integrand size = 37, $\frac{\text{number of rules}}{\text{integrand size}} = 0.216$, Rules used = {164, 1599, 1602, 12, 170, 418, 176, 424}

$$\frac{3740\sqrt{2-3x}\sqrt{4x+1}\sqrt{5x+7}}{3253419\sqrt{2x-5}} - \frac{9350\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}}{3253419\sqrt{5x+7}} + \frac{2\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}}{117(5x+7)^{3/2}} + \frac{44\sqrt{\frac{11}{23}}\sqrt{5x+7}F\left(\tan^{-1}\left(\frac{\sqrt{4x+1}}{\sqrt{2}\sqrt{2-3x}}\right), -\frac{39}{23}\right)}{2691\sqrt{2x-5}\sqrt{\frac{5x+7}{5-2x}}}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[2 - 3*x]*Sqrt[1 + 4*x])/(Sqrt[-5 + 2*x]*(7 + 5*x)^(5/2)), x]
```

```
[Out] (2*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/((117*(7 + 5*x)^(3/2)) - (9350*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/(3253419*Sqrt[7 + 5*x])) + (3740*Sqrt[2 - 3*x]*Sqrt[1 + 4*x]*Sqrt[7 + 5*x])/(3253419*Sqrt[-5 + 2*x]) - (1870*Sqrt[11/39]*Sqrt[2 - 3*x]*Sqrt[(7 + 5*x)/(5 - 2*x)]*EllipticE[ArcSin[(Sqrt[39/23]*Sqrt[1 + 4*x])/Sqrt[-5 + 2*x]], -23/39])/(83421*Sqrt[(2 - 3*x)/(5 - 2*x)]*Sqrt[7 + 5*x]) + (44*Sqrt[11/23]*Sqrt[7 + 5*x]*EllipticF[ArcTan[Sqrt[1 + 4*x]/(Sqrt[2]*Sqrt[2 - 3*x])], -39/23])/(2691*Sqrt[-5 + 2*x]*Sqrt[(7 + 5*x)/(5 - 2*x)])
```

Rule 164

```
Int[(((a_.) + (b_.)*(x_))^(m_)*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*
(x_)])/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] := Simp[((a + b*x)^(m + 1)*Sqrt[
c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/((m + 1)*(b*c - a*d)), x] - Dist[1/(2
*(m + 1)*(b*c - a*d)), Int[((a + b*x)^(m + 1)/(Sqrt[c + d*x]*Sqrt[e + f*x]*
Sqrt[g + h*x]))*Simp[c*(f*g + e*h) + d*e*g*(2*m + 3) + 2*(c*f*h + d*(m + 2)
*(f*g + e*h))*x + d*f*h*(2*m + 5)*x^2, x], x] /; FreeQ[{a, b, c, d, e,
f, g, h, m}, x] && IntegerQ[2*m] && LtQ[m, -1]
```

Rule 1599

```
Int[(((a_.) + (b_.)*(x_))^(m_)*((A_.) + (B_.)*(x_)))/(Sqrt[(c_.) + (d_.)*(x
_)]*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Simp[(
(A*b^2 - a*b*B)*(a + b*x)^(m + 1)*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]
)/((m + 1)*(b*c - a*d)*(b*e - a*f)*(b*g - a*h)), x] - Dist[1/(2*(m + 1)*(b*
c - a*d)*(b*e - a*f)*(b*g - a*h)), Int[((a + b*x)^(m + 1)/(Sqrt[c + d*x]*Sq
rt[e + f*x]*Sqrt[g + h*x]))*Simp[A*(2*a^2*d*f*h*(m + 1) - 2*a*b*(m + 1)*(d*
f*g + d*e*h + c*f*h) + b^2*(2*m + 3)*(d*e*g + c*f*g + c*e*h)) - b*B*(a*(d*e
*g + c*f*g + c*e*h) + 2*b*c*e*g*(m + 1)) - 2*((A*b - a*B)*(a*d*f*h*(m + 1)
- b*(m + 2)*(d*f*g + d*e*h + c*f*h)))*x + d*f*h*(2*m + 5)*(A*b^2 - a*b*B)*x
^2, x], x] /; FreeQ[{a, b, c, d, e, f, g, h, A, B}, x] && IntegerQ[2*m]
&& LtQ[m, -1]
```

Rule 1602

```
Int[((A_.) + (B_.)*(x_) + (C_.)*(x_)^2)/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.
) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol]
:= Simp[(C*Sqrt[a + b*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(b*f*h*Sqrt[c + d*
x]), x] + (Dist[1/(2*b*d*f*h), Int[(1*Simp[2*A*b*d*f*h - C*(b*d*e*g + a*c*f
*h) + (2*b*B*d*f*h - C*(a*d*f*h + b*(d*f*g + d*e*h + c*f*h)))*x, x])/(Sqrt[
a + b*x]*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]), x], x] + Dist[(C*(d*e
- c*f)*(d*g - c*h))/(2*b*d*f*h), Int[Sqrt[a + b*x]/((c + d*x)^(3/2)*Sqrt[e
+ f*x]*Sqrt[g + h*x]), x], x] /; FreeQ[{a, b, c, d, e, f, g, h, A, B, C},
x]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_)] /; FreeQ[b, x]
```

Rule 170

```
Int[1/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)
*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Dist[(2*Sqrt[g + h*x]*Sqrt[(
```

```
(b*e - a*f)*(c + d*x)/((d*e - c*f)*(a + b*x))]/((f*g - e*h)*Sqrt[c + d*x]
*Sqrt[-(((b*e - a*f)*(g + h*x))/((f*g - e*h)*(a + b*x))))], Subst[Int[1/(Sqrt[1 + ((b*c - a*d)*x^2)/(d*e - c*f)]*Sqrt[1 - ((b*g - a*h)*x^2)/(f*g - e*h)]]), x], x, Sqrt[e + f*x]/Sqrt[a + b*x]], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x]
```

Rule 418

```
Int[1/(Sqrt[(a_) + (b_.)*(x_)^2]*Sqrt[(c_) + (d_.)*(x_)^2]), x_Symbol] := Simp[(Sqrt[a + b*x^2]*EllipticF[ArcTan[Rt[d/c, 2]*x], 1 - (b*c)/(a*d)])/(a*Rt[d/c, 2]*Sqrt[c + d*x^2]*Sqrt[(c*(a + b*x^2))/(a*(c + d*x^2))]), x] /; FreeQ[{a, b, c, d}, x] && PosQ[d/c] && PosQ[b/a] && !SimplerSqrtQ[b/a, d/c]
```

Rule 176

```
Int[Sqrt[(c_.) + (d_.)*(x_)]/(((a_.) + (b_.)*(x_))^(3/2)*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Dist[(-2*Sqrt[c + d*x]*Sqrt[-(((b*e - a*f)*(g + h*x))/((f*g - e*h)*(a + b*x))))]/((b*e - a*f)*Sqrt[g + h*x]*Sqrt[((b*e - a*f)*(c + d*x))/((d*e - c*f)*(a + b*x))]), Subst[Int[Sqrt[1 + ((b*c - a*d)*x^2)/(d*e - c*f)]/Sqrt[1 - ((b*g - a*h)*x^2)/(f*g - e*h)], x], x, Sqrt[e + f*x]/Sqrt[a + b*x]], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x]
```

Rule 424

```
Int[Sqrt[(a_) + (b_.)*(x_)^2]/Sqrt[(c_) + (d_.)*(x_)^2], x_Symbol] := Simp[(Sqrt[a]*EllipticE[ArcSin[Rt[-(d/c), 2]*x], (b*c)/(a*d)])/(Sqrt[c]*Rt[-(d/c), 2]), x] /; FreeQ[{a, b, c, d}, x] && NegQ[d/c] && GtQ[c, 0] && GtQ[a, 0]
```

Rubi steps

$$\begin{aligned}
\int \frac{\sqrt{2-3x}\sqrt{1+4x}}{\sqrt{-5+2x}(7+5x)^{5/2}} dx &= \frac{2\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{117(7+5x)^{3/2}} - \frac{1}{117} \int \frac{-33+110x}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^{3/2}} dx \\
&= \frac{2\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{117(7+5x)^{3/2}} - \frac{9350\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{3253419\sqrt{7+5x}} - \frac{\int \frac{-66308-170170x+224400x^2}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}\sqrt{7+5x}}}{3253419} \\
&= \frac{2\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{117(7+5x)^{3/2}} - \frac{9350\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{3253419\sqrt{7+5x}} + \frac{3740\sqrt{2-3x}\sqrt{1+4x}\sqrt{7}}{3253419\sqrt{-5+2x}} \\
&= \frac{2\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{117(7+5x)^{3/2}} - \frac{9350\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{3253419\sqrt{7+5x}} + \frac{3740\sqrt{2-3x}\sqrt{1+4x}\sqrt{7}}{3253419\sqrt{-5+2x}} \\
&= \frac{2\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{117(7+5x)^{3/2}} - \frac{9350\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{3253419\sqrt{7+5x}} + \frac{3740\sqrt{2-3x}\sqrt{1+4x}\sqrt{7}}{3253419\sqrt{-5+2x}} \\
&= \frac{2\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{117(7+5x)^{3/2}} - \frac{9350\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{3253419\sqrt{7+5x}} + \frac{3740\sqrt{2-3x}\sqrt{1+4x}\sqrt{7}}{3253419\sqrt{-5+2x}}
\end{aligned}$$

Mathematica [A] time = 1.81928, size = 246, normalized size = 0.85

$$\frac{2\sqrt{2x-5}\sqrt{4x+1} \left(506\sqrt{682}(3x-2)\sqrt{\frac{8x^2-18x-5}{(2-3x)^2}}(5x+7)^2 \text{EllipticF} \left(\sin^{-1} \left(\sqrt{\frac{31}{39}} \sqrt{\frac{2x-5}{3x-2}} \right), \frac{39}{62} \right) + 31\sqrt{\frac{5x+7}{3x-2}} (58928x^3 - 94580x^2 + 22348x - 94580) \right)}{3253419\sqrt{2-3x}(5x+7)^{3/2}\sqrt{\frac{5x+7}{3x-2}}}$$

Antiderivative was successfully verified.

[In] Integrate[(Sqrt[2 - 3*x]*Sqrt[1 + 4*x])/(Sqrt[-5 + 2*x]*(7 + 5*x)^(5/2)), x]

[Out] (-2*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(31*Sqrt[(7 + 5*x)/(-2 + 3*x)]*(-23755 - 122348*x - 94580*x^2 + 58928*x^3) - 935*Sqrt[682]*(-2 + 3*x)*(7 + 5*x)^2*Sqrt[(-5 - 18*x + 8*x^2)/(2 - 3*x)^2]*EllipticE[ArcSin[Sqrt[31/39]*Sqrt[(-5 + 2*x)/(-2 + 3*x)]]], 39/62) + 506*Sqrt[682]*(-2 + 3*x)*(7 + 5*x)^2*Sqrt[(-5 - 18*x + 8*x^2)/(2 - 3*x)^2]*EllipticF[ArcSin[Sqrt[31/39]*Sqrt[(-5 + 2*x)/(-2 + 3*x)]]], 39/62))/(3253419*Sqrt[2 - 3*x]*(7 + 5*x)^(3/2)*Sqrt[(7 + 5*x)/(-2 + 3*x)])

$$(-2 + 3x)] * (-5 - 18x + 8x^2))$$

Maple [B] time = 0.028, size = 786, normalized size = 2.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] $\text{int}((2-3x)^{(1/2)}*(4x+1)^{(1/2)}/(7+5x)^{(5/2)}/(2x-5)^{(1/2)}, x)$

[Out]
$$\begin{aligned} & -2/3253419*(20240*11^{(1/2)}*((7+5x)/(4x+1))^{(1/2)}*3^{(1/2)}*13^{(1/2)}*((2x-5) \\ &)/(4x+1))^{(1/2)}*((-2+3x)/(4x+1))^{(1/2)}*\text{EllipticF}(1/31*31^{(1/2)}*11^{(1/2)}* \\ & ((7+5x)/(4x+1))^{(1/2)}, 1/39*31^{(1/2)}*78^{(1/2)})*x^3-74800*11^{(1/2)}*((7+5x) \\ &)/(4x+1))^{(1/2)}*3^{(1/2)}*13^{(1/2)}*((2x-5)/(4x+1))^{(1/2)}*((-2+3x)/(4x+1)) \\ & ^{(1/2)}*\text{EllipticE}(1/31*31^{(1/2)}*11^{(1/2)}*((7+5x)/(4x+1))^{(1/2)}, 1/39*31^{(1/2)} \\ & *78^{(1/2)})*x^3+38456*11^{(1/2)}*((7+5x)/(4x+1))^{(1/2)}*3^{(1/2)}*13^{(1/2)}*((\\ & 2x-5)/(4x+1))^{(1/2)}*((-2+3x)/(4x+1))^{(1/2)}*x^2*\text{EllipticF}(1/31*31^{(1/2)}* \\ & 11^{(1/2)}*((7+5x)/(4x+1))^{(1/2)}, 1/39*31^{(1/2)}*78^{(1/2)})-142120*11^{(1/2)}*((\\ & 7+5x)/(4x+1))^{(1/2)}*3^{(1/2)}*13^{(1/2)}*((2x-5)/(4x+1))^{(1/2)}*((-2+3x)/(4 \\ & *x+1))^{(1/2)}*x^2*\text{EllipticE}(1/31*31^{(1/2)}*11^{(1/2)}*((7+5x)/(4x+1))^{(1/2)}, 1 \\ & /39*31^{(1/2)}*78^{(1/2)})+15433*11^{(1/2)}*((7+5x)/(4x+1))^{(1/2)}*3^{(1/2)}*13^{(1 \\ & /2)}*((2x-5)/(4x+1))^{(1/2)}*((-2+3x)/(4x+1))^{(1/2)}*x*\text{EllipticF}(1/31*31^{(1 \\ & /2)}*11^{(1/2)}*((7+5x)/(4x+1))^{(1/2)}, 1/39*31^{(1/2)}*78^{(1/2)})-57035*11^{(1/2)} \\ & *((7+5x)/(4x+1))^{(1/2)}*3^{(1/2)}*13^{(1/2)}*((2x-5)/(4x+1))^{(1/2)}*((-2+3x) \\ &)/(4x+1))^{(1/2)}*x*\text{EllipticE}(1/31*31^{(1/2)}*11^{(1/2)}*((7+5x)/(4x+1))^{(1/2)}, \\ & 1/39*31^{(1/2)}*78^{(1/2)})+1771*11^{(1/2)}*((7+5x)/(4x+1))^{(1/2)}*3^{(1/2)}*13^{(1 \\ & /2)}*((2x-5)/(4x+1))^{(1/2)}*((-2+3x)/(4x+1))^{(1/2)}*\text{EllipticF}(1/31*31^{(1/2)} \\ &)*11^{(1/2)}*((7+5x)/(4x+1))^{(1/2)}, 1/39*31^{(1/2)}*78^{(1/2)})-6545*11^{(1/2)}*((\\ & 7+5x)/(4x+1))^{(1/2)}*3^{(1/2)}*13^{(1/2)}*((2x-5)/(4x+1))^{(1/2)}*((-2+3x)/(4 \\ & *x+1))^{(1/2)}*\text{EllipticE}(1/31*31^{(1/2)}*11^{(1/2)}*((7+5x)/(4x+1))^{(1/2)}, 1/39* \\ & 31^{(1/2)}*78^{(1/2)})-1312518*x^3+3086255*x^2+1200968*x-1783420)*(2x-5)^{(1/2)} \\ & *(4x+1)^{(1/2)}*(2-3x)^{(1/2)}/(120*x^4-182*x^3-385*x^2+197*x+70)/(7+5x)^{(1/2)} \\ & 2) \end{aligned}$$

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{4x+1}\sqrt{-3x+2}}{(5x+7)^{\frac{5}{2}}\sqrt{2x-5}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2-3*x)^(1/2)*(1+4*x)^(1/2)/(7+5*x)^(5/2)/(-5+2*x)^(1/2),x, algorithm="maxima")

[Out] integrate(sqrt(4*x + 1)*sqrt(-3*x + 2)/((5*x + 7)^(5/2)*sqrt(2*x - 5)), x)

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{5x+7}\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2}}{250x^4+425x^3-1155x^2-2989x-1715}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2-3*x)^(1/2)*(1+4*x)^(1/2)/(7+5*x)^(5/2)/(-5+2*x)^(1/2),x, algorithm="fricas")

[Out] integral(sqrt(5*x + 7)*sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)/(250*x^4 + 425*x^3 - 1155*x^2 - 2989*x - 1715), x)

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2-3*x)**(1/2)*(1+4*x)**(1/2)/(7+5*x)**(5/2)/(-5+2*x)**(1/2),x)

[Out] Timed out

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{4x+1}\sqrt{-3x+2}}{(5x+7)^{\frac{5}{2}}\sqrt{2x-5}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2-3*x)^(1/2)*(1+4*x)^(1/2)/(7+5*x)^(5/2)/(-5+2*x)^(1/2),x, algorithm="giac")

```
[Out] integrate(sqrt(4*x + 1)*sqrt(-3*x + 2)/((5*x + 7)^(5/2)*sqrt(2*x - 5)), x)
```

$$3.91 \quad \int \frac{\sqrt{2-3x}\sqrt{1+4x}}{\sqrt{-5+2x}(7+5x)^{7/2}} dx$$

Optimal. Leaf size=330

$$\frac{111628\sqrt{\frac{11}{23}}\sqrt{5x+7}\text{EllipticF}\left(\tan^{-1}\left(\frac{\sqrt{4x+1}}{\sqrt{2}\sqrt{2-3x}}\right), -\frac{39}{23}\right)}{74828637\sqrt{2x-5}\sqrt{\frac{5x+7}{5-2x}}} + \frac{8185936\sqrt{2-3x}\sqrt{4x+1}\sqrt{5x+7}}{90467822133\sqrt{2x-5}} - \frac{20464840\sqrt{2-3x}\sqrt{2x-5}}{90467822133\sqrt{5x+7}}$$

[Out] (2*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/(195*(7 + 5*x)^(5/2)) - (364
6*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/(16267095*(7 + 5*x)^(3/2)) -
(20464840*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/(90467822133*Sqrt[7 +
5*x]) + (8185936*Sqrt[2 - 3*x]*Sqrt[1 + 4*x]*Sqrt[7 + 5*x])/(90467822133*S
qrt[-5 + 2*x]) - (4092968*Sqrt[11/39]*Sqrt[2 - 3*x]*Sqrt[(7 + 5*x)/(5 - 2*x
2319687747*Sqrt[(2 - 3*x)/(5 - 2*x)]*Sqrt[7 + 5*x]) + (111628*Sqrt[11/23]*S
qrt[7 + 5*x]*EllipticF[ArcTan[Sqrt[1 + 4*x]/(Sqrt[2]*Sqrt[2 - 3*x])], -39/2
3])/(74828637*Sqrt[-5 + 2*x]*Sqrt[(7 + 5*x)/(5 - 2*x)])

Rubi [A] time = 0.398223, antiderivative size = 330, normalized size of antiderivative =
1., number of steps used = 9, number of rules used = 9, integrand size = 37, $\frac{\text{number of rules}}{\text{integrand size}} =$
0.243, Rules used = {164, 1604, 1599, 1602, 12, 170, 418, 176, 424}

$$\frac{8185936\sqrt{2-3x}\sqrt{4x+1}\sqrt{5x+7}}{90467822133\sqrt{2x-5}} - \frac{20464840\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}}{90467822133\sqrt{5x+7}} - \frac{3646\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}}{16267095(5x+7)^{3/2}} + \frac{2\sqrt{2-3x}\sqrt{2x-5}}{195(5x+7)}$$

Antiderivative was successfully verified.

[In] Int[(Sqrt[2 - 3*x]*Sqrt[1 + 4*x])/(Sqrt[-5 + 2*x]*(7 + 5*x)^(7/2)), x]

[Out] (2*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/(195*(7 + 5*x)^(5/2)) - (364
6*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/(16267095*(7 + 5*x)^(3/2)) -
(20464840*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/(90467822133*Sqrt[7 +
5*x]) + (8185936*Sqrt[2 - 3*x]*Sqrt[1 + 4*x]*Sqrt[7 + 5*x])/(90467822133*S
qrt[-5 + 2*x]) - (4092968*Sqrt[11/39]*Sqrt[2 - 3*x]*Sqrt[(7 + 5*x)/(5 - 2*x
2319687747*Sqrt[(2 - 3*x)/(5 - 2*x)]*Sqrt[7 + 5*x]) + (111628*Sqrt[11/23]*S
qrt[7 + 5*x]*EllipticF[ArcTan[Sqrt[1 + 4*x]/(Sqrt[2]*Sqrt[2 - 3*x])], -39/2

3)]/(74828637*Sqrt[-5 + 2*x]*Sqrt[(7 + 5*x)/(5 - 2*x)])

Rule 164

Int[(((a_.) + (b_.)*(x_))^(m_)*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] := Simp[((a + b*x)^(m + 1)*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/((m + 1)*(b*c - a*d)), x] - Dist[1/(2*(m + 1)*(b*c - a*d)), Int[((a + b*x)^(m + 1)/(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]))*Simp[c*(f*g + e*h) + d*e*g*(2*m + 3) + 2*(c*f*h + d*(m + 2)*(f*g + e*h))*x + d*f*h*(2*m + 5)*x^2, x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m}, x] && IntegerQ[2*m] && LtQ[m, -1]

Rule 1604

Int[(((a_.) + (b_.)*(x_))^(m_)*((A_.) + (B_.)*(x_) + (C_.)*(x_)^2))/(Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Simp[((A*b^2 - a*b*B + a^2*C)*(a + b*x)^(m + 1)*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/((m + 1)*(b*c - a*d)*(b*e - a*f)*(b*g - a*h)), x] - Dist[1/(2*(m + 1)*(b*c - a*d)*(b*e - a*f)*(b*g - a*h)), Int[((a + b*x)^(m + 1)/(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]))*Simp[A*(2*a^2*d*f*h*(m + 1) - 2*a*b*(m + 1)*(d*f*g + d*e*h + c*f*h) + b^2*(2*m + 3)*(d*e*g + c*f*g + c*e*h)) - (b*B - a*C)*(a*(d*e*g + c*f*g + c*e*h) + 2*b*c*e*g*(m + 1)) - 2*((A*b - a*B)*(a*d*f*h*(m + 1) - b*(m + 2)*(d*f*g + d*e*h + c*f*h)) - C*(a^2*(d*f*g + d*e*h + c*f*h) - b^2*c*e*g*(m + 1) + a*b*(m + 1)*(d*e*g + c*f*g + c*e*h)))*x + d*f*h*(2*m + 5)*(A*b^2 - a*b*B + a^2*C)*x^2, x], x] /; FreeQ[{a, b, c, d, e, f, g, h, A, B, C}, x] && IntegerQ[2*m] && LtQ[m, -1]

Rule 1599

Int[(((a_.) + (b_.)*(x_))^(m_)*((A_.) + (B_.)*(x_)))/(Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Simp[((A*b^2 - a*b*B)*(a + b*x)^(m + 1)*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/((m + 1)*(b*c - a*d)*(b*e - a*f)*(b*g - a*h)), x] - Dist[1/(2*(m + 1)*(b*c - a*d)*(b*e - a*f)*(b*g - a*h)), Int[((a + b*x)^(m + 1)/(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]))*Simp[A*(2*a^2*d*f*h*(m + 1) - 2*a*b*(m + 1)*(d*f*g + d*e*h + c*f*h) + b^2*(2*m + 3)*(d*e*g + c*f*g + c*e*h)) - b*B*(a*(d*e*g + c*f*g + c*e*h) + 2*b*c*e*g*(m + 1)) - 2*((A*b - a*B)*(a*d*f*h*(m + 1) - b*(m + 2)*(d*f*g + d*e*h + c*f*h)))*x + d*f*h*(2*m + 5)*(A*b^2 - a*b*B)*x^2, x], x] /; FreeQ[{a, b, c, d, e, f, g, h, A, B}, x] && IntegerQ[2*m] && LtQ[m, -1]

Rule 1602

Int[((A_.) + (B_.)*(x_) + (C_.)*(x_)^2)/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol]

```

1] :=> Simp[(C*Sqrt[a + b*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(b*f*h*Sqrt[c + d*
x]), x] + (Dist[1/(2*b*d*f*h), Int[(1*Simp[2*A*b*d*f*h - C*(b*d*e*g + a*c*f
*h) + (2*b*B*d*f*h - C*(a*d*f*h + b*(d*f*g + d*e*h + c*f*h)))*x, x])/(Sqrt[
a + b*x]*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]), x], x] + Dist[(C*(d*e
- c*f)*(d*g - c*h))/(2*b*d*f*h), Int[Sqrt[a + b*x]/((c + d*x)^(3/2)*Sqrt[e
+ f*x]*Sqrt[g + h*x]), x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, A, B, C},
x]

```

Rule 12

```

Int[(a_)*(u_), x_Symbol] :=> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_)] /; FreeQ[b, x]

```

Rule 170

```

Int[1/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)
*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] :=> Dist[(2*Sqrt[g + h*x]*Sqrt[(
(b*e - a*f)*(c + d*x))/((d*e - c*f)*(a + b*x))])]/((f*g - e*h)*Sqrt[c + d*x]
*Sqrt[-(((b*e - a*f)*(g + h*x))/((f*g - e*h)*(a + b*x)))]), Subst[Int[1/(Sq
rt[1 + ((b*c - a*d)*x^2)/(d*e - c*f)]*Sqrt[1 - ((b*g - a*h)*x^2)/(f*g - e*h
)]), x], x, Sqrt[e + f*x]/Sqrt[a + b*x]], x] /; FreeQ[{a, b, c, d, e, f, g,
h}, x]

```

Rule 418

```

Int[1/(Sqrt[(a_) + (b_.)*(x_)^2]*Sqrt[(c_) + (d_.)*(x_)^2]), x_Symbol] :=> S
imp[(Sqrt[a + b*x^2]*EllipticF[ArcTan[Rt[d/c, 2]*x], 1 - (b*c)/(a*d))]/(a*R
t[d/c, 2]*Sqrt[c + d*x^2]*Sqrt[(c*(a + b*x^2))/(a*(c + d*x^2))]), x] /; Fre
eQ[{a, b, c, d}, x] && PosQ[d/c] && PosQ[b/a] && !SimplerSqrtQ[b/a, d/c]

```

Rule 176

```

Int[Sqrt[(c_.) + (d_.)*(x_)]/(((a_.) + (b_.)*(x_))^(3/2)*Sqrt[(e_.) + (f_.)
*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] :=> Dist[(-2*Sqrt[c + d*x]*Sqrt[
-(((b*e - a*f)*(g + h*x))/((f*g - e*h)*(a + b*x)))])/((b*e - a*f)*Sqrt[g +
h*x]*Sqrt[(b*e - a*f)*(c + d*x))/((d*e - c*f)*(a + b*x))]), Subst[Int[Sqrt
[1 + ((b*c - a*d)*x^2)/(d*e - c*f)]/Sqrt[1 - ((b*g - a*h)*x^2)/(f*g - e*h)
], x], x, Sqrt[e + f*x]/Sqrt[a + b*x]], x] /; FreeQ[{a, b, c, d, e, f, g, h},
x]

```

Rule 424

```

Int[Sqrt[(a_) + (b_.)*(x_)^2]/Sqrt[(c_) + (d_.)*(x_)^2], x_Symbol] :=> Simp[
(Sqrt[a]*EllipticE[ArcSin[Rt[-(d/c), 2]*x], (b*c)/(a*d))]/(Sqrt[c]*Rt[-(d/c

```

), 2]), x] /; FreeQ[{a, b, c, d}, x] && NegQ[d/c] && GtQ[c, 0] && GtQ[a, 0]

Rubi steps

$$\begin{aligned}
 \int \frac{\sqrt{2-3x}\sqrt{1+4x}}{\sqrt{-5+2x}(7+5x)^{7/2}} dx &= \frac{2\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{195(7+5x)^{5/2}} - \frac{1}{195} \int \frac{-41+90x+48x^2}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^{5/2}} dx \\
 &= \frac{2\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{195(7+5x)^{5/2}} - \frac{3646\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{16267095(7+5x)^{3/2}} - \frac{\int \frac{-489390+1112210x}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^{5/2}} dx}{16267095} \\
 &= \frac{2\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{195(7+5x)^{5/2}} - \frac{3646\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{16267095(7+5x)^{3/2}} - \frac{20464840\sqrt{2-3x}\sqrt{-5}}{90467822133\sqrt{7}} \\
 &= \frac{2\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{195(7+5x)^{5/2}} - \frac{3646\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{16267095(7+5x)^{3/2}} - \frac{20464840\sqrt{2-3x}\sqrt{-5}}{90467822133\sqrt{7}} \\
 &= \frac{2\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{195(7+5x)^{5/2}} - \frac{3646\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{16267095(7+5x)^{3/2}} - \frac{20464840\sqrt{2-3x}\sqrt{-5}}{90467822133\sqrt{7}} \\
 &= \frac{2\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{195(7+5x)^{5/2}} - \frac{3646\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{16267095(7+5x)^{3/2}} - \frac{20464840\sqrt{2-3x}\sqrt{-5}}{90467822133\sqrt{7}} \\
 &= \frac{2\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{195(7+5x)^{5/2}} - \frac{3646\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{16267095(7+5x)^{3/2}} - \frac{20464840\sqrt{2-3x}\sqrt{-5}}{90467822133\sqrt{7}}
 \end{aligned}$$

Mathematica [A] time = 1.78881, size = 251, normalized size = 0.76

$$\frac{2\sqrt{2x-5}\sqrt{4x+1} \left(958111\sqrt{682}(3x-2)\sqrt{\frac{8x^2-18x-5}{(2-3x)^2}}(5x+7)^3 \text{EllipticF}\left(\sin^{-1}\left(\sqrt{\frac{31}{39}}\sqrt{\frac{2x-5}{3x-2}}\right), \frac{39}{62}\right) + 31\sqrt{\frac{5x+7}{3x-2}} \right) (3700512)}{90467822133\sqrt{7}}$$

Antiderivative was successfully verified.

[In] Integrate[(Sqrt[2 - 3*x]*Sqrt[1 + 4*x])/(Sqrt[-5 + 2*x]*(7 + 5*x)^(7/2)), x]

```
[Out] (-2*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(31*Sqrt[(7 + 5*x)/(-2 + 3*x)]*(-374624540
- 2271416114*x - 2953846743*x^2 + 643813106*x^3 + 370051256*x^4) - 2046484
*Sqrt[682]*(-2 + 3*x)*(7 + 5*x)^3*Sqrt[(-5 - 18*x + 8*x^2)/(2 - 3*x)^2]*Ell
ipticE[ArcSin[Sqrt[31/39]*Sqrt[(-5 + 2*x)/(-2 + 3*x)]], 39/62] + 958111*Sqr
t[682]*(-2 + 3*x)*(7 + 5*x)^3*Sqrt[(-5 - 18*x + 8*x^2)/(2 - 3*x)^2]*Ellipti
cF[ArcSin[Sqrt[31/39]*Sqrt[(-5 + 2*x)/(-2 + 3*x)]], 39/62)))/(90467822133*S
qrt[2 - 3*x]*(7 + 5*x)^(5/2)*Sqrt[(7 + 5*x)/(-2 + 3*x)]*(-5 - 18*x + 8*x^2)
)
```

Maple [B] time = 0.031, size = 973, normalized size = 3.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((2-3*x)^(1/2)*(4*x+1)^(1/2)/(7+5*x)^(7/2)/(2*x-5)^(1/2),x)
```

```
[Out] 2/90467822133*(818593600*11^(1/2)*((7+5*x)/(4*x+1))^(1/2)*3^(1/2)*13^(1/2)*
((2*x-5)/(4*x+1))^(1/2)*((-2+3*x)/(4*x+1))^(1/2)*EllipticE(1/31*31^(1/2)*11
^(1/2)*((7+5*x)/(4*x+1))^(1/2),1/39*31^(1/2)*78^(1/2))*x^4-126500000*11^(1/
2)*((7+5*x)/(4*x+1))^(1/2)*3^(1/2)*13^(1/2)*((2*x-5)/(4*x+1))^(1/2)*((-2+3*
x)/(4*x+1))^(1/2)*EllipticF(1/31*31^(1/2)*11^(1/2)*((7+5*x)/(4*x+1))^(1/2),
1/39*31^(1/2)*78^(1/2))*x^4+2701358880*11^(1/2)*((7+5*x)/(4*x+1))^(1/2)*3^(
1/2)*13^(1/2)*((2*x-5)/(4*x+1))^(1/2)*((-2+3*x)/(4*x+1))^(1/2)*EllipticE(1/
31*31^(1/2)*11^(1/2)*((7+5*x)/(4*x+1))^(1/2),1/39*31^(1/2)*78^(1/2))*x^3-41
7450000*11^(1/2)*((7+5*x)/(4*x+1))^(1/2)*3^(1/2)*13^(1/2)*((2*x-5)/(4*x+1))
^(1/2)*((-2+3*x)/(4*x+1))^(1/2)*EllipticF(1/31*31^(1/2)*11^(1/2)*((7+5*x)/(
4*x+1))^(1/2),1/39*31^(1/2)*78^(1/2))*x^3+2801636596*11^(1/2)*((7+5*x)/(4*x
+1))^(1/2)*3^(1/2)*13^(1/2)*((2*x-5)/(4*x+1))^(1/2)*((-2+3*x)/(4*x+1))^(1/
2))*x^2*EllipticE(1/31*31^(1/2)*11^(1/2)*((7+5*x)/(4*x+1))^(1/2),1/39*31^(1/2
)*78^(1/2))-432946250*11^(1/2)*((7+5*x)/(4*x+1))^(1/2)*3^(1/2)*13^(1/2)*((2
*x-5)/(4*x+1))^(1/2)*((-2+3*x)/(4*x+1))^(1/2))*x^2*EllipticF(1/31*31^(1/2)*1
1^(1/2)*((7+5*x)/(4*x+1))^(1/2),1/39*31^(1/2)*78^(1/2))+945475608*11^(1/2)*
((7+5*x)/(4*x+1))^(1/2)*3^(1/2)*13^(1/2)*((2*x-5)/(4*x+1))^(1/2)*((-2+3*x)/
(4*x+1))^(1/2))*x*EllipticE(1/31*31^(1/2)*11^(1/2)*((7+5*x)/(4*x+1))^(1/2),1
/39*31^(1/2)*78^(1/2))-146107500*11^(1/2)*((7+5*x)/(4*x+1))^(1/2)*3^(1/2)*1
3^(1/2)*((2*x-5)/(4*x+1))^(1/2)*((-2+3*x)/(4*x+1))^(1/2))*x*EllipticF(1/31*3
1^(1/2)*11^(1/2)*((7+5*x)/(4*x+1))^(1/2),1/39*31^(1/2)*78^(1/2))+100277716*
11^(1/2)*((7+5*x)/(4*x+1))^(1/2)*3^(1/2)*13^(1/2)*((2*x-5)/(4*x+1))^(1/2)*
((-2+3*x)/(4*x+1))^(1/2)*EllipticE(1/31*31^(1/2)*11^(1/2)*((7+5*x)/(4*x+1))^(
1/2),1/39*31^(1/2)*78^(1/2))-15496250*11^(1/2)*((7+5*x)/(4*x+1))^(1/2)*3^(
1/2)*13^(1/2)*((2*x-5)/(4*x+1))^(1/2)*((-2+3*x)/(4*x+1))^(1/2)*EllipticF(1/
```

$31 \cdot 31^{(1/2)} \cdot 11^{(1/2)} \cdot ((7+5x)/(4x+1))^{(1/2)}, 1/39 \cdot 31^{(1/2)} \cdot 78^{(1/2)} + 584375$
 $7936x^4 + 10390893586x^3 - 65568669813x^2 - 3127552098x + 26993559920) \cdot (2x-5)^{$
 $(1/2) \cdot (4x+1)^{(1/2)} \cdot (2-3x)^{(1/2)} / (120x^4 - 182x^3 - 385x^2 + 197x + 70) / (7+5x$
 $)^{(3/2)}$

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{4x+1}\sqrt{-3x+2}}{(5x+7)^2\sqrt{2x-5}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2-3*x)^(1/2)*(1+4*x)^(1/2)/(7+5*x)^(7/2)/(-5+2*x)^(1/2),x, algorithm="maxima")

[Out] integrate(sqrt(4*x + 1)*sqrt(-3*x + 2)/((5*x + 7)^(7/2)*sqrt(2*x - 5)), x)

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{5x+7}\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2}}{1250x^5 + 3875x^4 - 2800x^3 - 23030x^2 - 29498x - 12005}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2-3*x)^(1/2)*(1+4*x)^(1/2)/(7+5*x)^(7/2)/(-5+2*x)^(1/2),x, algorithm="fricas")

[Out] integral(sqrt(5*x + 7)*sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)/(1250*x^5 + 3875*x^4 - 2800*x^3 - 23030*x^2 - 29498*x - 12005), x)

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2-3*x)**(1/2)*(1+4*x)**(1/2)/(7+5*x)**(7/2)/(-5+2*x)**(1/2),x)

[Out] Timed out

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{4x+1}\sqrt{-3x+2}}{(5x+7)^{\frac{7}{2}}\sqrt{2x-5}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((2-3*x)^(1/2)*(1+4*x)^(1/2)/(7+5*x)^(7/2)/(-5+2*x)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(sqrt(4*x + 1)*sqrt(-3*x + 2)/((5*x + 7)^(7/2)*sqrt(2*x - 5)), x)
```

$$3.92 \quad \int \frac{\sqrt{2-3x}\sqrt{1+4x}}{\sqrt{-5+2x}(7+5x)^{9/2}} dx$$

Optimal. Leaf size=370

$$\frac{258506776\sqrt{\frac{11}{23}}\sqrt{5x+7}\text{EllipticF}\left(\tan^{-1}\left(\frac{\sqrt{4x+1}}{\sqrt{2}\sqrt{2-3x}}\right), -\frac{39}{23}\right)}{1618368818157\sqrt{2x-5}\sqrt{\frac{5x+7}{5-2x}}} + \frac{16377776536\sqrt{2-3x}\sqrt{4x+1}\sqrt{5x+7}}{1956607901151813\sqrt{2x-5}} - \frac{40944441340\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}}{1956607901151813\sqrt{5x+7}}$$

```
[Out] (2*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/(273*(7 + 5*x)^(7/2)) + (98*
Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/(1807455*(7 + 5*x)^(5/2)) - (32
17468*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/(50259901185*(7 + 5*x)^(3
/2)) - (40944441340*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/(1956607901
151813*Sqrt[7 + 5*x]) + (16377776536*Sqrt[2 - 3*x]*Sqrt[1 + 4*x]*Sqrt[7 + 5
*x])/(1956607901151813*Sqrt[-5 + 2*x]) - (8188888268*Sqrt[11/39]*Sqrt[2 - 3
*x]*Sqrt[(7 + 5*x)/(5 - 2*x)]*EllipticE[ArcSin[(Sqrt[39/23]*Sqrt[1 + 4*x])/
Sqrt[-5 + 2*x]], -23/39])/(50169433362867*Sqrt[(2 - 3*x)/(5 - 2*x)]*Sqrt[7
+ 5*x]) + (258506776*Sqrt[11/23]*Sqrt[7 + 5*x]*EllipticF[ArcTan[Sqrt[1 + 4*
x]/(Sqrt[2]*Sqrt[2 - 3*x])], -39/23])/(1618368818157*Sqrt[-5 + 2*x]*Sqrt[(7
+ 5*x)/(5 - 2*x)])
```

Rubi [A] time = 0.521292, antiderivative size = 370, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 9, integrand size = 37, $\frac{\text{number of rules}}{\text{integrand size}} = 0.243$, Rules used = {164, 1604, 1599, 1602, 12, 170, 418, 176, 424}

$$\frac{16377776536\sqrt{2-3x}\sqrt{4x+1}\sqrt{5x+7}}{1956607901151813\sqrt{2x-5}} - \frac{40944441340\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}}{1956607901151813\sqrt{5x+7}} - \frac{3217468\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}}{50259901185(5x+7)^{3/2}} +$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[2 - 3*x]*Sqrt[1 + 4*x])/(Sqrt[-5 + 2*x]*(7 + 5*x)^(9/2)), x]
```

```
[Out] (2*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/(273*(7 + 5*x)^(7/2)) + (98*
Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/(1807455*(7 + 5*x)^(5/2)) - (32
17468*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/(50259901185*(7 + 5*x)^(3
/2)) - (40944441340*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/(1956607901
151813*Sqrt[7 + 5*x]) + (16377776536*Sqrt[2 - 3*x]*Sqrt[1 + 4*x]*Sqrt[7 + 5
*x])/(1956607901151813*Sqrt[-5 + 2*x]) - (8188888268*Sqrt[11/39]*Sqrt[2 - 3
*x]*Sqrt[(7 + 5*x)/(5 - 2*x)]*EllipticE[ArcSin[(Sqrt[39/23]*Sqrt[1 + 4*x])/
```

$\text{Sqrt}[-5 + 2*x]], -23/39)]/(50169433362867*\text{Sqrt}[(2 - 3*x)/(5 - 2*x)]*\text{Sqrt}[7 + 5*x]) + (258506776*\text{Sqrt}[11/23]*\text{Sqrt}[7 + 5*x]*\text{EllipticF}[\text{ArcTan}[\text{Sqrt}[1 + 4*x]/(\text{Sqrt}[2]*\text{Sqrt}[2 - 3*x])]], -39/23)]/(1618368818157*\text{Sqrt}[-5 + 2*x]*\text{Sqrt}[(7 + 5*x)/(5 - 2*x)])$

Rule 164

$\text{Int}[(((a_.) + (b_.)*(x_))^{(m_)}*\text{Sqrt}[(e_.) + (f_.)*(x_)]*\text{Sqrt}[(g_.) + (h_.)*(x_)])/\text{Sqrt}[(c_.) + (d_.)*(x_)], x_Symbol] := \text{Simp}[(a + b*x)^{(m + 1)}*\text{Sqrt}[c + d*x]*\text{Sqrt}[e + f*x]*\text{Sqrt}[g + h*x])/((m + 1)*(b*c - a*d)), x] - \text{Dist}[1/(2*(m + 1)*(b*c - a*d)), \text{Int}[(a + b*x)^{(m + 1)}/(\text{Sqrt}[c + d*x]*\text{Sqrt}[e + f*x]*\text{Sqrt}[g + h*x])]*\text{Simp}[c*(f*g + e*h) + d*e*g*(2*m + 3) + 2*(c*f*h + d*(m + 2)*(f*g + e*h))*x + d*f*h*(2*m + 5)*x^2, x], x], x] /; \text{FreeQ}\{a, b, c, d, e, f, g, h, m\}, x] \&\& \text{IntegerQ}[2*m] \&\& \text{LtQ}[m, -1]$

Rule 1604

$\text{Int}[(((a_.) + (b_.)*(x_))^{(m_)}*((A_.) + (B_.)*(x_) + (C_.)*(x_)^2))/(\text{Sqrt}[(c_.) + (d_.)*(x_)]*\text{Sqrt}[(e_.) + (f_.)*(x_)]*\text{Sqrt}[(g_.) + (h_.)*(x_)]), x_Symbol] := \text{Simp}[(A*b^2 - a*b*B + a^2*C)*(a + b*x)^{(m + 1)}*\text{Sqrt}[c + d*x]*\text{Sqrt}[e + f*x]*\text{Sqrt}[g + h*x])/((m + 1)*(b*c - a*d)*(b*e - a*f)*(b*g - a*h)), x] - \text{Dist}[1/(2*(m + 1)*(b*c - a*d)*(b*e - a*f)*(b*g - a*h)), \text{Int}[(a + b*x)^{(m + 1)}/(\text{Sqrt}[c + d*x]*\text{Sqrt}[e + f*x]*\text{Sqrt}[g + h*x])]*\text{Simp}[A*(2*a^2*d*f*h*(m + 1) - 2*a*b*(m + 1)*(d*f*g + d*e*h + c*f*h) + b^2*(2*m + 3)*(d*e*g + c*f*g + c*e*h)) - (b*B - a*C)*(a*(d*e*g + c*f*g + c*e*h) + 2*b*c*e*g*(m + 1)) - 2*((A*b - a*B)*(a*d*f*h*(m + 1) - b*(m + 2)*(d*f*g + d*e*h + c*f*h)) - C*(a^2*(d*f*g + d*e*h + c*f*h) - b^2*c*e*g*(m + 1) + a*b*(m + 1)*(d*e*g + c*f*g + c*e*h)))*x + d*f*h*(2*m + 5)*(A*b^2 - a*b*B + a^2*C)*x^2, x], x], x] /; \text{FreeQ}\{a, b, c, d, e, f, g, h, A, B, C\}, x] \&\& \text{IntegerQ}[2*m] \&\& \text{LtQ}[m, -1]$

Rule 1599

$\text{Int}[(((a_.) + (b_.)*(x_))^{(m_)}*((A_.) + (B_.)*(x_)))/(\text{Sqrt}[(c_.) + (d_.)*(x_)]*\text{Sqrt}[(e_.) + (f_.)*(x_)]*\text{Sqrt}[(g_.) + (h_.)*(x_)]), x_Symbol] := \text{Simp}[(A*b^2 - a*b*B)*(a + b*x)^{(m + 1)}*\text{Sqrt}[c + d*x]*\text{Sqrt}[e + f*x]*\text{Sqrt}[g + h*x])/((m + 1)*(b*c - a*d)*(b*e - a*f)*(b*g - a*h)), x] - \text{Dist}[1/(2*(m + 1)*(b*c - a*d)*(b*e - a*f)*(b*g - a*h)), \text{Int}[(a + b*x)^{(m + 1)}/(\text{Sqrt}[c + d*x]*\text{Sqrt}[e + f*x]*\text{Sqrt}[g + h*x])]*\text{Simp}[A*(2*a^2*d*f*h*(m + 1) - 2*a*b*(m + 1)*(d*f*g + d*e*h + c*f*h) + b^2*(2*m + 3)*(d*e*g + c*f*g + c*e*h)) - b*B*(a*(d*e*g + c*f*g + c*e*h) + 2*b*c*e*g*(m + 1)) - 2*((A*b - a*B)*(a*d*f*h*(m + 1) - b*(m + 2)*(d*f*g + d*e*h + c*f*h)))*x + d*f*h*(2*m + 5)*(A*b^2 - a*b*B)*x^2, x], x], x] /; \text{FreeQ}\{a, b, c, d, e, f, g, h, A, B\}, x] \&\& \text{IntegerQ}[2*m] \&\& \text{LtQ}[m, -1]$

Rule 1602

```
Int[((A_.) + (B_.)*(x_) + (C_.)*(x_)^2)/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol]
:> Simp[(C*Sqrt[a + b*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(b*f*h*Sqrt[c + d*x]), x] + (Dist[1/(2*b*d*f*h), Int[(1*Simp[2*A*b*d*f*h - C*(b*d*e*g + a*c*f*h) + (2*b*B*d*f*h - C*(a*d*f*h + b*(d*f*g + d*e*h + c*f*h)))*x, x])/(Sqrt[a + b*x]*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]), x], x] + Dist[(C*(d*e - c*f)*(d*g - c*h))/(2*b*d*f*h), Int[Sqrt[a + b*x]/((c + d*x)^(3/2)*Sqrt[e + f*x]*Sqrt[g + h*x]), x], x) /; FreeQ[{a, b, c, d, e, f, g, h, A, B, C}, x]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 170

```
Int[1/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] :> Dist[(2*Sqrt[g + h*x]*Sqrt[(b*e - a*f)*(c + d*x)]/((d*e - c*f)*(a + b*x)))/((f*g - e*h)*Sqrt[c + d*x]*Sqrt[-(((b*e - a*f)*(g + h*x))/((f*g - e*h)*(a + b*x)))]), Subst[Int[1/(Sqrt[1 + ((b*c - a*d)*x^2)/(d*e - c*f)]*Sqrt[1 - ((b*g - a*h)*x^2)/(f*g - e*h)]), x], x, Sqrt[e + f*x]/Sqrt[a + b*x]], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x]
```

Rule 418

```
Int[1/(Sqrt[(a_) + (b_.)*(x_)^2]*Sqrt[(c_) + (d_.)*(x_)^2]), x_Symbol] :> Simp[(Sqrt[a + b*x^2]*EllipticF[ArcTan[Rt[d/c, 2]*x], 1 - (b*c)/(a*d)]/(a*Rt[d/c, 2]*Sqrt[c + d*x^2]*Sqrt[(c*(a + b*x^2))/(a*(c + d*x^2))]), x] /; FreeQ[{a, b, c, d}, x] && PosQ[d/c] && PosQ[b/a] && !SimplerSqrtQ[b/a, d/c]
```

Rule 176

```
Int[Sqrt[(c_.) + (d_.)*(x_)]/(((a_.) + (b_.)*(x_))^(3/2)*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] :> Dist[(-2*Sqrt[c + d*x]*Sqrt[-(((b*e - a*f)*(g + h*x))/((f*g - e*h)*(a + b*x)))]/((b*e - a*f)*Sqrt[g + h*x]*Sqrt[(b*e - a*f)*(c + d*x)]/((d*e - c*f)*(a + b*x)))]), Subst[Int[Sqrt[1 + ((b*c - a*d)*x^2)/(d*e - c*f)]/Sqrt[1 - ((b*g - a*h)*x^2)/(f*g - e*h)], x], x, Sqrt[e + f*x]/Sqrt[a + b*x]], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x]
```

Rule 424

```
Int[Sqrt[(a_) + (b_.)*(x_)^2]/Sqrt[(c_) + (d_.)*(x_)^2], x_Symbol] := Simp[
(Sqrt[a]*EllipticE[ArcSin[Rt[-(d/c), 2]*x], (b*c)/(a*d)])/(Sqrt[c]*Rt[-(d/c
), 2]), x] /; FreeQ[{a, b, c, d}, x] && NegQ[d/c] && GtQ[c, 0] && GtQ[a, 0]
```

Rubi steps

$$\begin{aligned}
\int \frac{\sqrt{2-3x}\sqrt{1+4x}}{\sqrt{-5+2x}(7+5x)^{9/2}} dx &= \frac{2\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{273(7+5x)^{7/2}} - \frac{1}{273} \int \frac{-49+70x+96x^2}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^{7/2}} dx \\
&= \frac{2\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{273(7+5x)^{7/2}} + \frac{98\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{1807455(7+5x)^{5/2}} - \frac{\int \frac{-958104+2280510x+49392x^2}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^{5/2}} dx}{37956555} \\
&= \frac{2\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{273(7+5x)^{7/2}} + \frac{98\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{1807455(7+5x)^{5/2}} - \frac{3217468\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{50259901185(7+5x)^3} \\
&= \frac{2\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{273(7+5x)^{7/2}} + \frac{98\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{1807455(7+5x)^{5/2}} - \frac{3217468\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{50259901185(7+5x)^3} \\
&= \frac{2\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{273(7+5x)^{7/2}} + \frac{98\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{1807455(7+5x)^{5/2}} - \frac{3217468\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{50259901185(7+5x)^3} \\
&= \frac{2\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{273(7+5x)^{7/2}} + \frac{98\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{1807455(7+5x)^{5/2}} - \frac{3217468\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{50259901185(7+5x)^3} \\
&= \frac{2\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{273(7+5x)^{7/2}} + \frac{98\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{1807455(7+5x)^{5/2}} - \frac{3217468\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{50259901185(7+5x)^3} \\
&= \frac{2\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{273(7+5x)^{7/2}} + \frac{98\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{1807455(7+5x)^{5/2}} - \frac{3217468\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{50259901185(7+5x)^3}
\end{aligned}$$

Mathematica [A] time = 2.19595, size = 258, normalized size = 0.7

$$2\sqrt{2x-5}\sqrt{4x+1}\sqrt{5x+7} \left(\frac{(3x-2)(2559027583750x^3+12313608173580x^2+19165803061167x+2552362046246)}{(5x+7)^4} - \frac{22(71545594\sqrt{682}(3x-2)\sqrt{\frac{8x^2-18x+7}{(2-3x)^2}})}{(5x+7)^4} \right)$$

1956607901151813 $\sqrt{2}$

Antiderivative was successfully verified.

[In] Integrate[(Sqrt[2 - 3*x]*Sqrt[1 + 4*x])/((Sqrt[-5 + 2*x]*(7 + 5*x)^(9/2))),x]

[Out] (2*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*Sqrt[7 + 5*x]*(((-2 + 3*x)*(2552362046246 + 19165803061167*x + 12313608173580*x^2 + 2559027583750*x^3)))/(7 + 5*x)^4 - (22*(558333291*Sqrt[(7 + 5*x)/(-2 + 3*x)]*(-5 - 18*x + 8*x^2) - 186111097*Sqrt[682]*(-2 + 3*x)*Sqrt[(-5 - 18*x + 8*x^2)/(2 - 3*x)^2]*EllipticE[ArcSin[Sqrt[31/39]*Sqrt[(-5 + 2*x)/(-2 + 3*x)]], 39/62] + 71545594*Sqrt[682]*(-2 + 3*x)*Sqrt[(-5 - 18*x + 8*x^2)/(2 - 3*x)^2]*EllipticF[ArcSin[Sqrt[31/39]*Sqrt[(-5 + 2*x)/(-2 + 3*x)]], 39/62]))/(Sqrt[(7 + 5*x)/(-2 + 3*x)]*(-5 - 18*x + 8*x^2)))/(1956607901151813*Sqrt[2 - 3*x])

Maple [B] time = 0.031, size = 1160, normalized size = 3.1

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] int((2-3*x)^(1/2)*(4*x+1)^(1/2)/(7+5*x)^(9/2)/(2*x-5)^(1/2),x)

[Out] -2/1956607901151813*(175178212000*11^(1/2)*((7+5*x)/(4*x+1))^(1/2)*3^(1/2)*13^(1/2)*((2*x-5)/(4*x+1))^(1/2)*((-2+3*x)/(4*x+1))^(1/2)*EllipticF(1/31*31^(1/2)*11^(1/2)*((7+5*x)/(4*x+1))^(1/2),1/39*31^(1/2)*78^(1/2))*x^5-8188888268000*11^(1/2)*((7+5*x)/(4*x+1))^(1/2)*3^(1/2)*13^(1/2)*((2*x-5)/(4*x+1))^(1/2)*((-2+3*x)/(4*x+1))^(1/2)*EllipticE(1/31*31^(1/2)*11^(1/2)*((7+5*x)/(4*x+1))^(1/2),1/39*31^(1/2)*78^(1/2))*x^5+823337596400*11^(1/2)*((7+5*x)/(4*x+1))^(1/2)*3^(1/2)*13^(1/2)*((2*x-5)/(4*x+1))^(1/2)*((-2+3*x)/(4*x+1))^(1/2)*EllipticF(1/31*31^(1/2)*11^(1/2)*((7+5*x)/(4*x+1))^(1/2),1/39*31^(1/2)*78^(1/2))*x^4-38487774859600*11^(1/2)*((7+5*x)/(4*x+1))^(1/2)*3^(1/2)*13^(1/2)*((2*x-5)/(4*x+1))^(1/2)*((-2+3*x)/(4*x+1))^(1/2)*EllipticE(1/31*31^(1/2)*11^(1/2)*((7+5*x)/(4*x+1))^(1/2),1/39*31^(1/2)*78^(1/2))*x^4+1408870770010*11^(1/2)*((7+5*x)/(4*x+1))^(1/2)*3^(1/2)*13^(1/2)*((2*x-5)/(4*x+1))^(1/2)*((-2+3*x)/(4*x+1))^(1/2)*EllipticF(1/31*31^(1/2)*11^(1/2)*((7+5*x)/(4*x+1))^(1/2),1/39*31^(1/2)*78^(1/2))*x^3-65859133895390*11^(1/2)*((7+5*x)/(4*x+1))^(1/2)*3^(1/2)*13^(1/2)*((2*x-5)/(4*x+1))^(1/2)*((-2+3*x)/(4*x+1))^(1/2)*EllipticE(1/31*31^(1/2)*11^(1/2)*((7+5*x)/(4*x+1))^(1/2),1/39*31^(1/2)*78^(1/2))*x^3+1041697237658*11^(1/2)*((7+5*x)/(4*x+1))^(1/2)*3^(1/2)*13^(1/2)*((2*x-5)/(4*x+1))^(1/2)*((-2+3*x)/(4*x+1))^(1/2)*x^2*EllipticF(1/31*31^(1/2)*11^(1/2)*((7+5*x)/(4*x+1))^(1/2),1/39*31^(1/2)*78^(1/2))-48695224085662*11^(1/2)*((7+5*x)/(4*x+1))^(1/2)*3^(1/2)*13^(1/2)*((2*x-5)/(4*x+1))^(1/2)*((-2+3*x)/(4*x+1))^(1/2)*x^2*EllipticE(1/31*31^(1/2)*11^(1/2)*((7+5*x)/(4*x+1))

$$\begin{aligned} & \wedge(1/2), 1/39*31^{\wedge}(1/2)*78^{\wedge}(1/2))+304722499774*11^{\wedge}(1/2)*((7+5*x)/(4*x+1))^{\wedge}(1/2) \\ &)*3^{\wedge}(1/2)*13^{\wedge}(1/2)*((2*x-5)/(4*x+1))^{\wedge}(1/2)*((-2+3*x)/(4*x+1))^{\wedge}(1/2)*x*\text{Ellip} \\ & \text{ticF}(1/31*31^{\wedge}(1/2)*11^{\wedge}(1/2)*((7+5*x)/(4*x+1))^{\wedge}(1/2), 1/39*31^{\wedge}(1/2)*78^{\wedge}(1/2)) \\ & -14244571142186*11^{\wedge}(1/2)*((7+5*x)/(4*x+1))^{\wedge}(1/2)*3^{\wedge}(1/2)*13^{\wedge}(1/2)*((2*x-5)/ \\ & (4*x+1))^{\wedge}(1/2)*((-2+3*x)/(4*x+1))^{\wedge}(1/2)*x*\text{EllipticE}(1/31*31^{\wedge}(1/2)*11^{\wedge}(1/2)* \\ & ((7+5*x)/(4*x+1))^{\wedge}(1/2), 1/39*31^{\wedge}(1/2)*78^{\wedge}(1/2))+30043063358*11^{\wedge}(1/2)*((7+5* \\ & x)/(4*x+1))^{\wedge}(1/2)*3^{\wedge}(1/2)*13^{\wedge}(1/2)*((2*x-5)/(4*x+1))^{\wedge}(1/2)*((-2+3*x)/(4*x+1 \\ &))^{\wedge}(1/2)*\text{EllipticF}(1/31*31^{\wedge}(1/2)*11^{\wedge}(1/2)*((7+5*x)/(4*x+1))^{\wedge}(1/2), 1/39*31^{\wedge}(\\ & 1/2)*78^{\wedge}(1/2))-1404394337962*11^{\wedge}(1/2)*((7+5*x)/(4*x+1))^{\wedge}(1/2)*3^{\wedge}(1/2)*13^{\wedge}(1 \\ & /2)*((2*x-5)/(4*x+1))^{\wedge}(1/2)*((-2+3*x)/(4*x+1))^{\wedge}(1/2)*\text{EllipticE}(1/31*31^{\wedge}(1/2) \\ &)*11^{\wedge}(1/2)*((7+5*x)/(4*x+1))^{\wedge}(1/2), 1/39*31^{\wedge}(1/2)*78^{\wedge}(1/2))-33052545587580*x \\ & ^5-83732628367442*x^4+43651554581534*x^3+1041927172311711*x^2-1311200489909 \\ & 80*x-367706794166900)*(2*x-5)^{\wedge}(1/2)*(4*x+1)^{\wedge}(1/2)*(2-3*x)^{\wedge}(1/2)/(120*x^4-18 \\ & 2*x^3-385*x^2+197*x+70)/(7+5*x)^{\wedge}(5/2) \end{aligned}$$

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{4x+1}\sqrt{-3x+2}}{(5x+7)^2\sqrt{2x-5}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2-3*x)^(1/2)*(1+4*x)^(1/2)/(7+5*x)^(9/2)/(-5+2*x)^(1/2), x, algorith="maxima")

[Out] integrate(sqrt(4*x + 1)*sqrt(-3*x + 2)/((5*x + 7)^(9/2)*sqrt(2*x - 5)), x)

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{5x+7}\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2}}{6250x^6+28125x^5+13125x^4-134750x^3-308700x^2-266511x-84035}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2-3*x)^(1/2)*(1+4*x)^(1/2)/(7+5*x)^(9/2)/(-5+2*x)^(1/2), x, algorith="fricas")

[Out] integral(sqrt(5*x + 7)*sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)/(6250*x^6 + 28125*x^5 + 13125*x^4 - 134750*x^3 - 308700*x^2 - 266511*x - 84035), x)

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2-3*x)**(1/2)*(1+4*x)**(1/2)/(7+5*x)**(9/2)/(-5+2*x)**(1/2),x)

[Out] Timed out

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{4x+1}\sqrt{-3x+2}}{(5x+7)^{\frac{9}{2}}\sqrt{2x-5}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2-3*x)^(1/2)*(1+4*x)^(1/2)/(7+5*x)^(9/2)/(-5+2*x)^(1/2),x, algorithm="giac")

[Out] integrate(sqrt(4*x + 1)*sqrt(-3*x + 2)/((5*x + 7)^(9/2)*sqrt(2*x - 5)), x)

$$3.93 \quad \int \frac{\sqrt{2-3x}(7+5x)^{5/2}}{\sqrt{-5+2x}\sqrt{1+4x}} dx$$

Optimal. Leaf size=391

$$\frac{5241511\sqrt{\frac{11}{23}}\sqrt{5x+7}\text{EllipticF}\left(\tan^{-1}\left(\frac{\sqrt{4x+1}}{\sqrt{2}\sqrt{2-3x}}\right), -\frac{39}{23}\right)}{13824\sqrt{2x-5}\sqrt{\frac{5x+7}{5-2x}}} + \frac{5}{24}\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}(5x+7)^{3/2} + \frac{6955\sqrt{2-3x}\sqrt{2x-5}}{1152}$$

```
[Out] (102487*Sqrt[2 - 3*x]*Sqrt[1 + 4*x]*Sqrt[7 + 5*x])/(1536*Sqrt[-5 + 2*x]) +
(6955*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*Sqrt[7 + 5*x])/1152 + (5*S
qrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(7 + 5*x)^(3/2))/24 - (102487*Sqr
t[143/3]*Sqrt[2 - 3*x]*Sqrt[(7 + 5*x)/(5 - 2*x)]*EllipticE[ArcSin[(Sqrt[39/
23]*Sqrt[1 + 4*x])/Sqrt[-5 + 2*x]], -23/39])/(1024*Sqrt[(2 - 3*x)/(5 - 2*x)
]*Sqrt[7 + 5*x]) + (5241511*Sqrt[11/23]*Sqrt[7 + 5*x]*EllipticF[ArcTan[Sqrt
[1 + 4*x]/(Sqrt[2]*Sqrt[2 - 3*x])], -39/23])/(13824*Sqrt[-5 + 2*x]*Sqrt[(7
+ 5*x)/(5 - 2*x)]) + (295576909*(2 - 3*x)*Sqrt[(5 - 2*x)/(2 - 3*x)]*Sqrt[-(
(1 + 4*x)/(2 - 3*x))]*EllipticPi[-69/55, ArcSin[(Sqrt[11/23]*Sqrt[7 + 5*x])
/Sqrt[2 - 3*x]], -23/39])/(13824*Sqrt[429]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])
```

Rubi [A] time = 0.420862, antiderivative size = 391, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 10, integrand size = 37, $\frac{\text{number of rules}}{\text{integrand size}} = 0.27$, Rules used = {174, 1600, 1602, 1598, 170, 418, 165, 537, 176, 424}

$$\frac{5}{24}\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}(5x+7)^{3/2} + \frac{6955\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}\sqrt{5x+7}}{1152} + \frac{102487\sqrt{2-3x}\sqrt{4x+1}\sqrt{5x+7}}{1536\sqrt{2x-5}} + \dots$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[2 - 3*x]*(7 + 5*x)^(5/2))/(Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]), x]
```

```
[Out] (102487*Sqrt[2 - 3*x]*Sqrt[1 + 4*x]*Sqrt[7 + 5*x])/(1536*Sqrt[-5 + 2*x]) +
(6955*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*Sqrt[7 + 5*x])/1152 + (5*S
qrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(7 + 5*x)^(3/2))/24 - (102487*Sqr
t[143/3]*Sqrt[2 - 3*x]*Sqrt[(7 + 5*x)/(5 - 2*x)]*EllipticE[ArcSin[(Sqrt[39/
23]*Sqrt[1 + 4*x])/Sqrt[-5 + 2*x]], -23/39])/(1024*Sqrt[(2 - 3*x)/(5 - 2*x)
]*Sqrt[7 + 5*x]) + (5241511*Sqrt[11/23]*Sqrt[7 + 5*x]*EllipticF[ArcTan[Sqrt
[1 + 4*x]/(Sqrt[2]*Sqrt[2 - 3*x])], -39/23])/(13824*Sqrt[-5 + 2*x]*Sqrt[(7
+ 5*x)/(5 - 2*x)]) + (295576909*(2 - 3*x)*Sqrt[(5 - 2*x)/(2 - 3*x)]*Sqrt[-(
```

$(1 + 4x)/(2 - 3x)) * \text{EllipticPi}[-69/55, \text{ArcSin}[(\text{Sqrt}[11/23] * \text{Sqrt}[7 + 5x]) / \text{Sqrt}[2 - 3x]], -23/39)] / (13824 * \text{Sqrt}[429] * \text{Sqrt}[-5 + 2x] * \text{Sqrt}[1 + 4x])$

Rule 174

$\text{Int}[(((a_.) + (b_.)*(x_.))^{(m_.)} * \text{Sqrt}[(c_.) + (d_.)*(x_.)]) / (\text{Sqrt}[(e_.) + (f_.)*(x_.)] * \text{Sqrt}[(g_.) + (h_.)*(x_.)]), x_Symbol] \rightarrow \text{Simp}[(2*b*(a + b*x)^{(m-1)} * \text{Sqrt}[c + d*x] * \text{Sqrt}[e + f*x] * \text{Sqrt}[g + h*x]) / (f*h*(2*m + 1)), x] - \text{Dist}[1/(f*h*(2*m + 1)), \text{Int}[(((a + b*x)^{(m-2)}) / (\text{Sqrt}[c + d*x] * \text{Sqrt}[e + f*x] * \text{Sqrt}[g + h*x])) * \text{Simp}[a*b*(d*e*g + c*(f*g + e*h)) + 2*b^2*c*e*g*(m-1) - a^2*c*f*h*(2*m + 1) + (b^2*(2*m-1)*(d*e*g + c*(f*g + e*h)) - a^2*d*f*h*(2*m + 1) + 2*a*b*(d*f*g + d*e*h - 2*c*f*h*m)) * x - b*(a*d*f*h*(4*m-1) + b*(c*f*h - 2*d*(f*g + e*h)*m)) * x^2, x], x], x] /; \text{FreeQ}\{a, b, c, d, e, f, g, h, m\}, x] \&\& \text{IntegerQ}[2*m] \&\& \text{GtQ}[m, 1]$

Rule 1600

$\text{Int}[(((a_.) + (b_.)*(x_.))^{(m_.)} * ((A_.) + (B_.)*(x_.) + (C_.)*(x_.)^2)) / (\text{Sqrt}[(c_.) + (d_.)*(x_.)] * \text{Sqrt}[(e_.) + (f_.)*(x_.)] * \text{Sqrt}[(g_.) + (h_.)*(x_.)]), x_Symbol] \rightarrow \text{Simp}[(2*C*(a + b*x)^m * \text{Sqrt}[c + d*x] * \text{Sqrt}[e + f*x] * \text{Sqrt}[g + h*x]) / (d*f*h*(2*m + 3)), x] + \text{Dist}[1/(d*f*h*(2*m + 3)), \text{Int}[((a + b*x)^{(m-1)}) / (\text{Sqrt}[c + d*x] * \text{Sqrt}[e + f*x] * \text{Sqrt}[g + h*x])] * \text{Simp}[a*A*d*f*h*(2*m + 3) - C*(a*(d*e*g + c*f*g + c*e*h) + 2*b*c*e*g*m) + ((A*b + a*B)*d*f*h*(2*m + 3) - C*(2*a*(d*f*g + d*e*h + c*f*h) + b*(2*m + 1)*(d*e*g + c*f*g + c*e*h)) * x + (b*B*d*f*h*(2*m + 3) + 2*C*(a*d*f*h*m - b*(m + 1)*(d*f*g + d*e*h + c*f*h)) * x^2, x], x], x] /; \text{FreeQ}\{a, b, c, d, e, f, g, h, A, B, C\}, x] \&\& \text{IntegerQ}[2*m] \&\& \text{GtQ}[m, 0]$

Rule 1602

$\text{Int}[((A_.) + (B_.)*(x_.) + (C_.)*(x_.)^2) / (\text{Sqrt}[(a_.) + (b_.)*(x_.)] * \text{Sqrt}[(c_.) + (d_.)*(x_.)] * \text{Sqrt}[(e_.) + (f_.)*(x_.)] * \text{Sqrt}[(g_.) + (h_.)*(x_.)]), x_Symbol] \rightarrow \text{Simp}[(C * \text{Sqrt}[a + b*x] * \text{Sqrt}[e + f*x] * \text{Sqrt}[g + h*x]) / (b*f*h * \text{Sqrt}[c + d*x]), x] + (\text{Dist}[1/(2*b*d*f*h), \text{Int}[(1 * \text{Simp}[2*A*b*d*f*h - C*(b*d*e*g + a*c*f*h) + (2*b*B*d*f*h - C*(a*d*f*h + b*(d*f*g + d*e*h + c*f*h)) * x], x)] / (\text{Sqrt}[a + b*x] * \text{Sqrt}[c + d*x] * \text{Sqrt}[e + f*x] * \text{Sqrt}[g + h*x]), x], x] + \text{Dist}[(C*(d*e - c*f)*(d*g - c*h)) / (2*b*d*f*h), \text{Int}[\text{Sqrt}[a + b*x] / ((c + d*x)^{(3/2)} * \text{Sqrt}[e + f*x] * \text{Sqrt}[g + h*x]), x], x)] /; \text{FreeQ}\{a, b, c, d, e, f, g, h, A, B, C\}, x]$

Rule 1598

$\text{Int}[((A_.) + (B_.)*(x_.)) / (\text{Sqrt}[(a_.) + (b_.)*(x_.)] * \text{Sqrt}[(c_.) + (d_.)*(x_.)] * \text{Sqrt}[(e_.) + (f_.)*(x_.)] * \text{Sqrt}[(g_.) + (h_.)*(x_.)]), x_Symbol] \rightarrow \text{Dist}[(A*b - a*B)/b, \text{Int}[1/(\text{Sqrt}[a + b*x] * \text{Sqrt}[c + d*x] * \text{Sqrt}[e + f*x] * \text{Sqrt}[g + h*x]),$

$x], x] + \text{Dist}[B/b, \text{Int}[\text{Sqrt}[a + b*x]/(\text{Sqrt}[c + d*x]*\text{Sqrt}[e + f*x]*\text{Sqrt}[g + h*x]), x], x] /; \text{FreeQ}\{a, b, c, d, e, f, g, h, A, B\}, x]$

Rule 170

$\text{Int}[1/(\text{Sqrt}[(a_.) + (b_.)*(x_.)]*\text{Sqrt}[(c_.) + (d_.)*(x_.)]*\text{Sqrt}[(e_.) + (f_.)*(x_.)]*\text{Sqrt}[(g_.) + (h_.)*(x_.)]), x_Symbol] \rightarrow \text{Dist}[(2*\text{Sqrt}[g + h*x]*\text{Sqrt}[(b*e - a*f)*(c + d*x)]/((d*e - c*f)*(a + b*x))]/((f*g - e*h)*\text{Sqrt}[c + d*x]*\text{Sqrt}[-(((b*e - a*f)*(g + h*x))/((f*g - e*h)*(a + b*x)))]), \text{Subst}[\text{Int}[1/(\text{Sqrt}[1 + ((b*c - a*d)*x^2)/(d*e - c*f)]*\text{Sqrt}[1 - ((b*g - a*h)*x^2)/(f*g - e*h)]), x], x, \text{Sqrt}[e + f*x]/\text{Sqrt}[a + b*x]], x] /; \text{FreeQ}\{a, b, c, d, e, f, g, h\}, x]$

Rule 418

$\text{Int}[1/(\text{Sqrt}[(a_) + (b_)*(x_)^2]*\text{Sqrt}[(c_) + (d_)*(x_)^2]), x_Symbol] \rightarrow \text{Simp}[(\text{Sqrt}[a + b*x^2]*\text{EllipticF}[\text{ArcTan}[\text{Rt}[d/c, 2]*x], 1 - (b*c)/(a*d)]/(a*\text{Rt}[d/c, 2]*\text{Sqrt}[c + d*x^2]*\text{Sqrt}[(c*(a + b*x^2))/(a*(c + d*x^2))]), x] /; \text{FreeQ}\{a, b, c, d\}, x] \&\& \text{PosQ}[d/c] \&\& \text{PosQ}[b/a] \&\& \text{!SimplerSqrtQ}[b/a, d/c]$

Rule 165

$\text{Int}[\text{Sqrt}[(a_.) + (b_.)*(x_.)]/(\text{Sqrt}[(c_.) + (d_.)*(x_.)]*\text{Sqrt}[(e_.) + (f_.)*(x_.)]*\text{Sqrt}[(g_.) + (h_.)*(x_.)]), x_Symbol] \rightarrow \text{Dist}[(2*(a + b*x)*\text{Sqrt}[(b*g - a*h)*(c + d*x)]/((d*g - c*h)*(a + b*x))]*\text{Sqrt}[(b*g - a*h)*(e + f*x)]/((f*g - e*h)*(a + b*x))]/(\text{Sqrt}[c + d*x]*\text{Sqrt}[e + f*x]), \text{Subst}[\text{Int}[1/((h - b*x^2)*\text{Sqrt}[1 + ((b*c - a*d)*x^2)/(d*g - c*h)]*\text{Sqrt}[1 + ((b*e - a*f)*x^2)/(f*g - e*h)]), x], x, \text{Sqrt}[g + h*x]/\text{Sqrt}[a + b*x]], x] /; \text{FreeQ}\{a, b, c, d, e, f, g, h\}, x]$

Rule 537

$\text{Int}[1/(((a_) + (b_)*(x_)^2)*\text{Sqrt}[(c_) + (d_)*(x_)^2]*\text{Sqrt}[(e_) + (f_)*(x_)^2]), x_Symbol] \rightarrow \text{Simp}[(1*\text{EllipticPi}[(b*c)/(a*d), \text{ArcSin}[\text{Rt}[-(d/c), 2]*x], (c*f)/(d*e)]/(a*\text{Sqrt}[c]*\text{Sqrt}[e]*\text{Rt}[-(d/c), 2]), x] /; \text{FreeQ}\{a, b, c, d, e, f\}, x] \&\& \text{!GtQ}[d/c, 0] \&\& \text{GtQ}[c, 0] \&\& \text{GtQ}[e, 0] \&\& \text{!(!GtQ}[f/e, 0] \&\& \text{SimplerSqrtQ}[-(f/e), -(d/c)])]$

Rule 176

$\text{Int}[\text{Sqrt}[(c_.) + (d_.)*(x_.)]/(((a_.) + (b_.)*(x_.))^(3/2)*\text{Sqrt}[(e_.) + (f_.)*(x_.)]*\text{Sqrt}[(g_.) + (h_.)*(x_.)]), x_Symbol] \rightarrow \text{Dist}[(-2*\text{Sqrt}[c + d*x]*\text{Sqrt}[-(((b*e - a*f)*(g + h*x))/((f*g - e*h)*(a + b*x)))]/((b*e - a*f)*\text{Sqrt}[g + h*x]*\text{Sqrt}[(b*e - a*f)*(c + d*x)]/((d*e - c*f)*(a + b*x)))]), \text{Subst}[\text{Int}[\text{Sqrt}[1 + ((b*c - a*d)*x^2)/(d*e - c*f)]/\text{Sqrt}[1 - ((b*g - a*h)*x^2)/(f*g - e*h)]$

, x], x, Sqrt[e + f*x]/Sqrt[a + b*x]], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x]

Rule 424

Int[Sqrt[(a_) + (b_.)*(x_)^2]/Sqrt[(c_) + (d_.)*(x_)^2], x_Symbol] := Simp[(Sqrt[a]*EllipticE[ArcSin[Rt[-(d/c), 2]*x], (b*c)/(a*d)])/(Sqrt[c]*Rt[-(d/c), 2]), x] /; FreeQ[{a, b, c, d}, x] && NegQ[d/c] && GtQ[c, 0] && GtQ[a, 0]

Rubi steps

$$\begin{aligned} \int \frac{\sqrt{2-3x}(7+5x)^{5/2}}{\sqrt{-5+2x}\sqrt{1+4x}} dx &= \frac{5}{24} \sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^{3/2} - \frac{1}{48} \int \frac{\sqrt{7+5x}(-6189+3136x+13910x^2)}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}} dx \\ &= \frac{6955\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}\sqrt{7+5x}}{1152} + \frac{5}{24} \sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^{3/2} + \frac{\int \frac{689}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}} dx}{24} \\ &= \frac{102487\sqrt{2-3x}\sqrt{1+4x}\sqrt{7+5x}}{1536\sqrt{-5+2x}} + \frac{6955\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}\sqrt{7+5x}}{1152} + \frac{5}{24} \sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^{3/2} \\ &= \frac{102487\sqrt{2-3x}\sqrt{1+4x}\sqrt{7+5x}}{1536\sqrt{-5+2x}} + \frac{6955\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}\sqrt{7+5x}}{1152} + \frac{5}{24} \sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^{3/2} \\ &= \frac{102487\sqrt{2-3x}\sqrt{1+4x}\sqrt{7+5x}}{1536\sqrt{-5+2x}} + \frac{6955\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}\sqrt{7+5x}}{1152} + \frac{5}{24} \sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^{3/2} \\ &= \frac{102487\sqrt{2-3x}\sqrt{1+4x}\sqrt{7+5x}}{1536\sqrt{-5+2x}} + \frac{6955\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}\sqrt{7+5x}}{1152} + \frac{5}{24} \sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^{3/2} \end{aligned}$$

Mathematica [A] time = 2.44502, size = 340, normalized size = 0.87

$$\sqrt{2x-5}\sqrt{4x+1} \left(46704724\sqrt{682}\sqrt{\frac{8x^2-18x-5}{(2-3x)^2}} (15x^2+11x-14) \text{EllipticF}\left(\sin^{-1}\left(\sqrt{\frac{31}{39}}\sqrt{\frac{2x-5}{3x-2}}\right), \frac{39}{62}\right) - 57187746\sqrt{682}\sqrt{2x-5} \right)$$

Warning: Unable to verify antiderivative.

[In] Integrate[(Sqrt[2 - 3*x]*(7 + 5*x)^(5/2))/(Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]),x]

[Out] $-(\text{Sqrt}[-5 + 2x] \cdot \text{Sqrt}[1 + 4x] \cdot (-57187746 \cdot \text{Sqrt}[682] \cdot \text{Sqrt}[(-5 - 18x + 8x^2)/(2 - 3x)^2] \cdot (-14 + 11x + 15x^2) \cdot \text{EllipticE}[\text{ArcSin}[\text{Sqrt}[31/39] \cdot \text{Sqrt}[(-5 + 2x)/(-2 + 3x)]]], 39/62] + 46704724 \cdot \text{Sqrt}[682] \cdot \text{Sqrt}[(-5 - 18x + 8x^2)/(2 - 3x)^2] \cdot (-14 + 11x + 15x^2) \cdot \text{EllipticF}[\text{ArcSin}[\text{Sqrt}[31/39] \cdot \text{Sqrt}[(-5 + 2x)/(-2 + 3x)]]], 39/62] + \text{Sqrt}[(7 + 5x)/(-2 + 3x)] \cdot (186 \cdot (-27447805 - 124999073x - 56065622x^2 + 20626760x^3 + 6542400x^4 + 1152000x^5) + 47673695 \cdot \text{Sqrt}[682] \cdot (2 - 3x)^2 \cdot \text{Sqrt}[(1 + 4x)/(-2 + 3x)] \cdot \text{Sqrt}[(-35 - 11x + 10x^2)/(2 - 3x)^2] \cdot \text{EllipticPi}[117/62, \text{ArcSin}[\text{Sqrt}[31/39] \cdot \text{Sqrt}[(-5 + 2x)/(-2 + 3x)]]], 39/62)))/((1714176 \cdot \text{Sqrt}[2 - 3x] \cdot \text{Sqrt}[7 + 5x] \cdot \text{Sqrt}[(7 + 5x)/(-2 + 3x)]) \cdot (-5 - 18x + 8x^2))$

Maple [B] time = 0.036, size = 885, normalized size = 2.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] int((7+5*x)^(5/2)*(2-3*x)^(1/2)/(2*x-5)^(1/2)/(4*x+1)^(1/2),x)

[Out] $-1/7907328 \cdot (7+5x)^{1/2} \cdot (2-3x)^{1/2} \cdot (2x-5)^{1/2} \cdot (4x+1)^{1/2} \cdot (193959920 \cdot 11^{1/2} \cdot ((7+5x)/(4x+1))^{1/2} \cdot 3^{1/2} \cdot 13^{1/2} \cdot ((2x-5)/(4x+1))^{1/2}) \cdot ((-2+3x)/(4x+1))^{1/2} \cdot x^2 \cdot \text{EllipticF}(1/31 \cdot 31^{1/2} \cdot 11^{1/2} \cdot ((7+5x)/(4x+1))^{1/2}, 1/39 \cdot 31^{1/2} \cdot 78^{1/2}) - 3508783952 \cdot 11^{1/2} \cdot ((7+5x)/(4x+1))^{1/2} \cdot 3^{1/2} \cdot 13^{1/2} \cdot ((2x-5)/(4x+1))^{1/2} \cdot ((-2+3x)/(4x+1))^{1/2} \cdot x^2 \cdot \text{EllipticPi}(1/31 \cdot 31^{1/2} \cdot 11^{1/2} \cdot ((7+5x)/(4x+1))^{1/2}, 124/55, 1/39 \cdot 31^{1/2} \cdot 78^{1/2}) - 4220824608 \cdot 11^{1/2} \cdot ((7+5x)/(4x+1))^{1/2} \cdot 3^{1/2} \cdot 13^{1/2} \cdot ((2x-5)/(4x+1))^{1/2} \cdot ((-2+3x)/(4x+1))^{1/2} \cdot x^2 \cdot \text{EllipticE}(1/31 \cdot 31^{1/2} \cdot 11^{1/2} \cdot ((7+5x)/(4x+1))^{1/2}, 1/39 \cdot 31^{1/2} \cdot 78^{1/2}) + 96979960 \cdot 11^{1/2} \cdot ((7+5x)/(4x+1))^{1/2} \cdot 3^{1/2} \cdot 13^{1/2} \cdot ((2x-5)/(4x+1))^{1/2} \cdot ((-2+3x)/(4x+1))^{1/2} \cdot x \cdot \text{EllipticF}(1/31 \cdot 31^{1/2} \cdot 11^{1/2} \cdot ((7+5x)/(4x+1))^{1/2}, 1/39 \cdot 31^{1/2} \cdot 78^{1/2}) - 1754391976 \cdot 11^{1/2} \cdot ((7+5x)/(4x+1))^{1/2} \cdot 3^{1/2} \cdot 13^{1/2} \cdot ((2x-5)/(4x+1))^{1/2} \cdot ((-2+3x)/(4x+1))^{1/2} \cdot x \cdot \text{EllipticPi}(1/31 \cdot 31^{1/2} \cdot 11^{1/2} \cdot ((7+5x)/(4x+1))^{1/2}, 124/55, 1/39 \cdot 31^{1/2} \cdot 78^{1/2}) - 2110412304 \cdot 11^{1/2} \cdot ((7+5x)/(4x+1))^{1/2} \cdot 3^{1/2} \cdot 13^{1/2} \cdot ((2x-5)/(4x+1))^{1/2} \cdot ((-2+3x)/(4x+1))^{1/2} \cdot x \cdot \text{EllipticE}(1/31 \cdot 31^{1/2} \cdot 11^{1/2} \cdot ((7+5x)/(4x+1))^{1/2}, 1/39 \cdot 31^{1/2} \cdot 78^{1/2}) + 12122495 \cdot 11^{1/2} \cdot ((7+5x)/(4x+1))^{1/2} \cdot 3^{1/2} \cdot 13^{1/2} \cdot ((2x-5)/(4x+1))^{1/2} \cdot ((-2+3x)/(4x+1))^{1/2} \cdot \text{EllipticF}(1/31 \cdot 31^{1/2} \cdot 11^{1/2} \cdot ((7+5x)/(4x+1))^{1/2}, 1/39 \cdot 31^{1/2} \cdot 78^{1/2}) - 219298997 \cdot 11^{1/2} \cdot ((7+5x)/(4x+1))^{1/2} \cdot 3^{1/2} \cdot 13^{1/2} \cdot ((2x-5)/(4x+1))^{1/2} \cdot ((-2+3x)/(4x+1))^{1/2} \cdot \text{EllipticPi}(1/31 \cdot 31^{1/2} \cdot 11^{1/2} \cdot ((7+5x)/(4x+1))^{1/2}, 124/55, 1/39 \cdot 31^{1/2} \cdot 78^{1/2})$

)*((7+5*x)/(4*x+1))^(1/2), 124/55, 1/39*31^(1/2)*78^(1/2))-263801538*11^(1/2)
 *((7+5*x)/(4*x+1))^(1/2)*3^(1/2)*13^(1/2)*((2*x-5)/(4*x+1))^(1/2)*((-2+3*x)
 /(4*x+1))^(1/2)*EllipticE(1/31*31^(1/2)*11^(1/2)*((7+5*x)/(4*x+1))^(1/2), 1/
 39*31^(1/2)*78^(1/2))-988416000*x^5-5613379200*x^4-17697760080*x^3+77122472
 856*x^2+75329218536*x-78013375440)/(120*x^4-182*x^3-385*x^2+197*x+70)

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(5x+7)^{\frac{5}{2}} \sqrt{-3x+2}}{\sqrt{4x+1} \sqrt{2x-5}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((7+5*x)^(5/2)*(2-3*x)^(1/2)/(-5+2*x)^(1/2)/(1+4*x)^(1/2), x, algorithm="maxima")

[Out] integrate((5*x + 7)^(5/2)*sqrt(-3*x + 2)/(sqrt(4*x + 1)*sqrt(2*x - 5)), x)

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{(25x^2 + 70x + 49)\sqrt{5x+7}\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2}}{8x^2 - 18x - 5}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((7+5*x)^(5/2)*(2-3*x)^(1/2)/(-5+2*x)^(1/2)/(1+4*x)^(1/2), x, algorithm="fricas")

[Out] integral((25*x^2 + 70*x + 49)*sqrt(5*x + 7)*sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)/(8*x^2 - 18*x - 5), x)

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((7+5*x)**(5/2)*(2-3*x)**(1/2)/(-5+2*x)**(1/2)/(1+4*x)**(1/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(5x+7)^{\frac{5}{2}}\sqrt{-3x+2}}{\sqrt{4x+1}\sqrt{2x-5}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((7+5*x)^(5/2)*(2-3*x)^(1/2)/(-5+2*x)^(1/2)/(1+4*x)^(1/2),x, algo
ithm="giac")
```

```
[Out] integrate((5*x + 7)^(5/2)*sqrt(-3*x + 2)/(sqrt(4*x + 1)*sqrt(2*x - 5)), x)
```

$$3.94 \quad \int \frac{\sqrt{2-3x}(7+5x)^{3/2}}{\sqrt{-5+2x}\sqrt{1+4x}} dx$$

Optimal. Leaf size=351

$$\frac{17515\sqrt{\frac{11}{23}}\sqrt{5x+7}\text{EllipticF}\left(\tan^{-1}\left(\frac{\sqrt{4x+1}}{\sqrt{2}\sqrt{2-3x}}\right), -\frac{39}{23}\right)}{576\sqrt{2x-5}\sqrt{\frac{5x+7}{5-2x}}} + \frac{5}{16}\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}\sqrt{5x+7} + \frac{785\sqrt{2-3x}\sqrt{4x+1}\sqrt{5x+7}}{192\sqrt{2x-5}}$$

```
[Out] (785*Sqrt[2 - 3*x]*Sqrt[1 + 4*x]*Sqrt[7 + 5*x])/(192*Sqrt[-5 + 2*x]) + (5*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*Sqrt[7 + 5*x])/16 - (785*Sqrt[143/3]*Sqrt[2 - 3*x]*Sqrt[(7 + 5*x)/(5 - 2*x)]*EllipticE[ArcSin[(Sqrt[39/23]*Sqrt[1 + 4*x])/Sqrt[-5 + 2*x]], -23/39])/(128*Sqrt[(2 - 3*x)/(5 - 2*x)]*Sqrt[7 + 5*x]) + (17515*Sqrt[11/23]*Sqrt[7 + 5*x]*EllipticF[ArcTan[Sqrt[1 + 4*x]/(Sqrt[2]*Sqrt[2 - 3*x])], -39/23])/(576*Sqrt[-5 + 2*x]*Sqrt[(7 + 5*x)/(5 - 2*x)]) + (3730013*(2 - 3*x)*Sqrt[(5 - 2*x)/(2 - 3*x)]*Sqrt[-((1 + 4*x)/(2 - 3*x))]*EllipticPi[-69/55, ArcSin[(Sqrt[11/23]*Sqrt[7 + 5*x])/Sqrt[2 - 3*x]], -23/39])/(2880*Sqrt[429]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])
```

Rubi [A] time = 0.321651, antiderivative size = 351, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 9, integrand size = 37, $\frac{\text{number of rules}}{\text{integrand size}} = 0.243$, Rules used = {174, 1602, 1598, 170, 418, 165, 537, 176, 424}

$$\frac{5}{16}\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}\sqrt{5x+7} + \frac{785\sqrt{2-3x}\sqrt{4x+1}\sqrt{5x+7}}{192\sqrt{2x-5}} + \frac{17515\sqrt{\frac{11}{23}}\sqrt{5x+7}F\left(\tan^{-1}\left(\frac{\sqrt{4x+1}}{\sqrt{2}\sqrt{2-3x}}\right)\middle| -\frac{39}{23}\right)}{576\sqrt{2x-5}\sqrt{\frac{5x+7}{5-2x}}}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[2 - 3*x]*(7 + 5*x)^(3/2))/(Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]),x]
```

```
[Out] (785*Sqrt[2 - 3*x]*Sqrt[1 + 4*x]*Sqrt[7 + 5*x])/(192*Sqrt[-5 + 2*x]) + (5*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*Sqrt[7 + 5*x])/16 - (785*Sqrt[143/3]*Sqrt[2 - 3*x]*Sqrt[(7 + 5*x)/(5 - 2*x)]*EllipticE[ArcSin[(Sqrt[39/23]*Sqrt[1 + 4*x])/Sqrt[-5 + 2*x]], -23/39])/(128*Sqrt[(2 - 3*x)/(5 - 2*x)]*Sqrt[7 + 5*x]) + (17515*Sqrt[11/23]*Sqrt[7 + 5*x]*EllipticF[ArcTan[Sqrt[1 + 4*x]/(Sqrt[2]*Sqrt[2 - 3*x])], -39/23])/(576*Sqrt[-5 + 2*x]*Sqrt[(7 + 5*x)/(5 - 2*x)]) + (3730013*(2 - 3*x)*Sqrt[(5 - 2*x)/(2 - 3*x)]*Sqrt[-((1 + 4*x)/(2 - 3*x))]*EllipticPi[-69/55, ArcSin[(Sqrt[11/23]*Sqrt[7 + 5*x])/Sqrt[2 - 3*x]]
```

x]], -23/39)]/(2880*sqrt[429]*sqrt[-5 + 2*x]*sqrt[1 + 4*x])

Rule 174

Int[(((a_.) + (b_.)*(x_))^(m_)*sqrt[(c_.) + (d_.)*(x_)])/(sqrt[(e_.) + (f_.)*(x_)]*sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Simp[(2*b*(a + b*x)^(m - 1)*sqrt[c + d*x]*sqrt[e + f*x]*sqrt[g + h*x])/(f*h*(2*m + 1)), x] - Dist[1/(f*h*(2*m + 1)), Int[((a + b*x)^(m - 2)/(sqrt[c + d*x]*sqrt[e + f*x]*sqrt[g + h*x]))*Simp[a*b*(d*e*g + c*(f*g + e*h)) + 2*b^2*c*e*g*(m - 1) - a^2*c*f*h*(2*m + 1) + (b^2*(2*m - 1)*(d*e*g + c*(f*g + e*h)) - a^2*d*f*h*(2*m + 1) + 2*a*b*(d*f*g + d*e*h - 2*c*f*h*m))*x - b*(a*d*f*h*(4*m - 1) + b*(c*f*h - 2*d*(f*g + e*h)*m))*x^2, x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m}, x] && IntegerQ[2*m] && GtQ[m, 1]

Rule 1602

Int[((A_.) + (B_.)*(x_) + (C_.)*(x_)^2)/(sqrt[(a_.) + (b_.)*(x_)]*sqrt[(c_.) + (d_.)*(x_)]*sqrt[(e_.) + (f_.)*(x_)]*sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Simp[(C*sqrt[a + b*x]*sqrt[e + f*x]*sqrt[g + h*x])/(b*f*h*sqrt[c + d*x]), x] + (Dist[1/(2*b*d*f*h), Int[(1*Simp[2*A*b*d*f*h - C*(b*d*e*g + a*c*f*h) + (2*b*B*d*f*h - C*(a*d*f*h + b*(d*f*g + d*e*h + c*f*h)))*x, x])/(sqrt[a + b*x]*sqrt[c + d*x]*sqrt[e + f*x]*sqrt[g + h*x]), x], x] + Dist[(C*(d*e - c*f)*(d*g - c*h))/(2*b*d*f*h), Int[sqrt[a + b*x]/((c + d*x)^(3/2)*sqrt[e + f*x]*sqrt[g + h*x]), x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, A, B, C}, x]

Rule 1598

Int[((A_.) + (B_.)*(x_))/(sqrt[(a_.) + (b_.)*(x_)]*sqrt[(c_.) + (d_.)*(x_)]*sqrt[(e_.) + (f_.)*(x_)]*sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Dist[(A*b - a*B)/b, Int[1/(sqrt[a + b*x]*sqrt[c + d*x]*sqrt[e + f*x]*sqrt[g + h*x]), x], x] + Dist[B/b, Int[sqrt[a + b*x]/(sqrt[c + d*x]*sqrt[e + f*x]*sqrt[g + h*x]), x], x] /; FreeQ[{a, b, c, d, e, f, g, h, A, B}, x]

Rule 170

Int[1/(sqrt[(a_.) + (b_.)*(x_)]*sqrt[(c_.) + (d_.)*(x_)]*sqrt[(e_.) + (f_.)*(x_)]*sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Dist[(2*sqrt[g + h*x]*sqrt[(b*e - a*f)*(c + d*x)]/((d*e - c*f)*(a + b*x)))/((f*g - e*h)*sqrt[c + d*x]*sqrt[-((b*e - a*f)*(g + h*x))/((f*g - e*h)*(a + b*x))]), Subst[Int[1/sqrt[1 + ((b*c - a*d)*x^2)/(d*e - c*f]]*sqrt[1 - ((b*g - a*h)*x^2)/(f*g - e*h)], x], x, sqrt[e + f*x]/sqrt[a + b*x]], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x]

Rule 418

```
Int[1/(Sqrt[(a_) + (b_.)*(x_)^2]*Sqrt[(c_) + (d_.)*(x_)^2]), x_Symbol] := S
imp[(Sqrt[a + b*x^2]*EllipticF[ArcTan[Rt[d/c, 2]*x], 1 - (b*c)/(a*d)]/(a*R
t[d/c, 2]*Sqrt[c + d*x^2]*Sqrt[(c*(a + b*x^2))/(a*(c + d*x^2))]), x] /; Fre
eQ[{a, b, c, d}, x] && PosQ[d/c] && PosQ[b/a] && !SimplerSqrtQ[b/a, d/c]
```

Rule 165

```
Int[Sqrt[(a_.) + (b_.)*(x_)]/(Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(
x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Dist[(2*(a + b*x)*Sqrt[((b*g -
a*h)*(c + d*x))/((d*g - c*h)*(a + b*x))]*Sqrt[((b*g - a*h)*(e + f*x))/((f*
g - e*h)*(a + b*x))])/(Sqrt[c + d*x]*Sqrt[e + f*x]), Subst[Int[1/((h - b*x^
2)*Sqrt[1 + ((b*c - a*d)*x^2]/(d*g - c*h)]*Sqrt[1 + ((b*e - a*f)*x^2)/(f*g
- e*h)]), x], x, Sqrt[g + h*x]/Sqrt[a + b*x]], x] /; FreeQ[{a, b, c, d, e,
f, g, h}, x]
```

Rule 537

```
Int[1/(((a_) + (b_.)*(x_)^2)*Sqrt[(c_) + (d_.)*(x_)^2]*Sqrt[(e_) + (f_.)*(x
_)^2]), x_Symbol] := Simp[(1*EllipticPi[(b*c)/(a*d), ArcSin[Rt[-(d/c), 2]*x
], (c*f)/(d*e))]/(a*Sqrt[c]*Sqrt[e]*Rt[-(d/c), 2]), x] /; FreeQ[{a, b, c, d
, e, f}, x] && !GtQ[d/c, 0] && GtQ[c, 0] && GtQ[e, 0] && !( !GtQ[f/e, 0]
&& SimplerSqrtQ[-(f/e), -(d/c)])
```

Rule 176

```
Int[Sqrt[(c_.) + (d_.)*(x_)]/(((a_.) + (b_.)*(x_))^(3/2)*Sqrt[(e_.) + (f_.)
*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Dist[(-2*Sqrt[c + d*x]*Sqrt[
-(((b*e - a*f)*(g + h*x))/((f*g - e*h)*(a + b*x)))])/((b*e - a*f)*Sqrt[g +
h*x]*Sqrt[((b*e - a*f)*(c + d*x))/((d*e - c*f)*(a + b*x))]), Subst[Int[Sqrt
[1 + ((b*c - a*d)*x^2)/(d*e - c*f)]/Sqrt[1 - ((b*g - a*h)*x^2)/(f*g - e*h)]
, x], x, Sqrt[e + f*x]/Sqrt[a + b*x]], x] /; FreeQ[{a, b, c, d, e, f, g, h}
, x]
```

Rule 424

```
Int[Sqrt[(a_) + (b_.)*(x_)^2]/Sqrt[(c_) + (d_.)*(x_)^2], x_Symbol] := Simp[
(Sqrt[a]*EllipticE[ArcSin[Rt[-(d/c), 2]*x], (b*c)/(a*d)]/(Sqrt[c]*Rt[-(d/c
), 2]), x] /; FreeQ[{a, b, c, d}, x] && NegQ[d/c] && GtQ[c, 0] && GtQ[a, 0]
```

Rubi steps

$$\begin{aligned}
\int \frac{\sqrt{2-3x}(7+5x)^{3/2}}{\sqrt{-5+2x}\sqrt{1+4x}} dx &= \frac{5}{16} \sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}\sqrt{7+5x} - \frac{1}{32} \int \frac{-4121 + 4074x + 7850x^2}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}\sqrt{7+5x}} dx \\
&= \frac{785\sqrt{2-3x}\sqrt{1+4x}\sqrt{7+5x}}{192\sqrt{-5+2x}} + \frac{5}{16} \sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}\sqrt{7+5x} + \frac{\int \frac{2888740-2406460x}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}} dx}{7680} \\
&= \frac{785\sqrt{2-3x}\sqrt{1+4x}\sqrt{7+5x}}{192\sqrt{-5+2x}} + \frac{5}{16} \sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}\sqrt{7+5x} + \frac{120323 \int \frac{\sqrt{2-3x}}{\sqrt{-5+2x}\sqrt{1+4x}} dx}{1152} \\
&= \frac{785\sqrt{2-3x}\sqrt{1+4x}\sqrt{7+5x}}{192\sqrt{-5+2x}} + \frac{5}{16} \sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}\sqrt{7+5x} - \frac{785\sqrt{\frac{143}{3}}\sqrt{2-3x}\sqrt{1+4x}}{128} \\
&= \frac{785\sqrt{2-3x}\sqrt{1+4x}\sqrt{7+5x}}{192\sqrt{-5+2x}} + \frac{5}{16} \sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}\sqrt{7+5x} - \frac{785\sqrt{\frac{143}{3}}\sqrt{2-3x}\sqrt{1+4x}}{128}
\end{aligned}$$

Mathematica [A] time = 3.14792, size = 349, normalized size = 0.99

$$\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}\sqrt{5x+7} \left(\frac{998820\sqrt{682}(5x+7)\sqrt{\frac{8x^2-18x-5}{(2-3x)^2}} \operatorname{EllipticF}\left(\sin^{-1}\left(\sqrt{\frac{31}{39}}\sqrt{\frac{2x-5}{3x-2}}\right), \frac{39}{62}\right) - 1314090\sqrt{682}(5x+7)\sqrt{\frac{8x^2-18x-5}{(2-3x)^2}} E\left(\sin^{-1}\left(\sqrt{\frac{31}{39}}\sqrt{\frac{2x-5}{3x-2}}\right)\right)}{(2-3x)^2} \right)$$

642816

Warning: Unable to verify antiderivative.

[In] Integrate[(Sqrt[2 - 3*x]*(7 + 5*x)^(3/2))/(Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]),x]

[Out] (Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*Sqrt[7 + 5*x]*(200880 + ((2 - 3*x)*((-1314090*Sqrt[682]*(7 + 5*x)*Sqrt[(-5 - 18*x + 8*x^2)/(2 - 3*x)^2]*EllipticE[ArcSin[Sqrt[31/39]*Sqrt[(-5 + 2*x)/(-2 + 3*x)]], 39/62)]/(2 - 3*x)^2 + (998820*Sqrt[682]*(7 + 5*x)*Sqrt[(-5 - 18*x + 8*x^2)/(2 - 3*x)^2]*EllipticF[ArcSin[Sqrt[31/39]*Sqrt[(-5 + 2*x)/(-2 + 3*x)]], 39/62)]/(2 - 3*x)^2 + Sqrt[(7 + 5*x)/(-2 + 3*x)]*((3942270*(-35 - 151*x - 34*x^2 + 40*x^3)))/(-2

$$+ 3*x)^3 + (1082907*\text{Sqrt}[682]*((1 + 4*x)/(-2 + 3*x))^{(3/2)}*\text{Sqrt}[(-35 - 11*x + 10*x^2)/(2 - 3*x)^2]*\text{EllipticPi}[117/62, \text{ArcSin}[\text{Sqrt}[31/39]*\text{Sqrt}[(-5 + 2*x)/(-2 + 3*x)]]], 39/62)]/(1 + 4*x)))/(((7 + 5*x)/(-2 + 3*x))^{(3/2)}*(5 + 18*x - 8*x^2)))/642816$$

Maple [B] time = 0.024, size = 880, normalized size = 2.5

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] $\text{int}((7+5*x)^{(3/2)}*(2-3*x)^{(1/2)}/(2*x-5)^{(1/2)}/(4*x+1)^{(1/2)}, x)$

[Out] $1/1647360*(7+5*x)^{(1/2)}*(2-3*x)^{(1/2)}*(2*x-5)^{(1/2)}*(4*x+1)^{(1/2)}*(1963280*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}*3^{(1/2)}*13^{(1/2)}*((2*x-5)/(4*x+1))^{(1/2)}*((-2+3*x)/(4*x+1))^{(1/2)}*x^2*\text{EllipticF}(1/31*31^{(1/2)}*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}, 1/39*31^{(1/2)}*78^{(1/2)})+44278864*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}*3^{(1/2)}*13^{(1/2)}*((2*x-5)/(4*x+1))^{(1/2)}*((-2+3*x)/(4*x+1))^{(1/2)}*x^2*\text{EllipticPi}(1/31*31^{(1/2)}*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}, 124/55, 1/39*31^{(1/2)}*78^{(1/2)})+53882400*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}*3^{(1/2)}*13^{(1/2)}*((2*x-5)/(4*x+1))^{(1/2)}*((-2+3*x)/(4*x+1))^{(1/2)}*x^2*\text{EllipticE}(1/31*31^{(1/2)}*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}, 1/39*31^{(1/2)}*78^{(1/2)})+981640*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}*3^{(1/2)}*13^{(1/2)}*((2*x-5)/(4*x+1))^{(1/2)}*((-2+3*x)/(4*x+1))^{(1/2)}*x*\text{EllipticF}(1/31*31^{(1/2)}*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}, 1/39*31^{(1/2)}*78^{(1/2)})+22139432*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}*3^{(1/2)}*13^{(1/2)}*((2*x-5)/(4*x+1))^{(1/2)}*((-2+3*x)/(4*x+1))^{(1/2)}*x*\text{EllipticPi}(1/31*31^{(1/2)}*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}, 124/55, 1/39*31^{(1/2)}*78^{(1/2)})+26941200*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}*3^{(1/2)}*13^{(1/2)}*((2*x-5)/(4*x+1))^{(1/2)}*((-2+3*x)/(4*x+1))^{(1/2)}*x*\text{EllipticE}(1/31*31^{(1/2)}*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}, 1/39*31^{(1/2)}*78^{(1/2)})+122705*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}*3^{(1/2)}*13^{(1/2)}*((2*x-5)/(4*x+1))^{(1/2)}*((-2+3*x)/(4*x+1))^{(1/2)}*\text{EllipticF}(1/31*31^{(1/2)}*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}, 1/39*31^{(1/2)}*78^{(1/2)})+2767429*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}*3^{(1/2)}*13^{(1/2)}*((2*x-5)/(4*x+1))^{(1/2)}*((-2+3*x)/(4*x+1))^{(1/2)}*\text{EllipticPi}(1/31*31^{(1/2)}*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}, 124/55, 1/39*31^{(1/2)}*78^{(1/2)})+3367650*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}*3^{(1/2)}*13^{(1/2)}*((2*x-5)/(4*x+1))^{(1/2)}*((-2+3*x)/(4*x+1))^{(1/2)}*\text{EllipticE}(1/31*31^{(1/2)}*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}, 1/39*31^{(1/2)}*78^{(1/2)})+310424400*x^3+61776000*x^4-912139800*x^2-1016644200*x+978978000)/(120*x^4-182*x^3-385*x^2+197*x+70)$

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(5x+7)^{\frac{3}{2}} \sqrt{-3x+2}}{\sqrt{4x+1} \sqrt{2x-5}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((7+5*x)^(3/2)*(2-3*x)^(1/2)/(-5+2*x)^(1/2)/(1+4*x)^(1/2),x, algorithm="maxima")

[Out] integrate((5*x + 7)^(3/2)*sqrt(-3*x + 2)/(sqrt(4*x + 1)*sqrt(2*x - 5)), x)

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral} \left(\frac{(5x+7)^{\frac{3}{2}} \sqrt{4x+1} \sqrt{2x-5} \sqrt{-3x+2}}{8x^2 - 18x - 5}, x \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((7+5*x)^(3/2)*(2-3*x)^(1/2)/(-5+2*x)^(1/2)/(1+4*x)^(1/2),x, algorithm="fricas")

[Out] integral((5*x + 7)^(3/2)*sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)/(8*x^2 - 18*x - 5), x)

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((7+5*x)**(3/2)*(2-3*x)**(1/2)/(-5+2*x)**(1/2)/(1+4*x)**(1/2),x)

[Out] Timed out

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(5x+7)^{\frac{3}{2}} \sqrt{-3x+2}}{\sqrt{4x+1} \sqrt{2x-5}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((7+5*x)^(3/2)*(2-3*x)^(1/2)/(-5+2*x)^(1/2)/(1+4*x)^(1/2),x, algor  
ithm="giac")
```

```
[Out] integrate((5*x + 7)^(3/2)*sqrt(-3*x + 2)/(sqrt(4*x + 1)*sqrt(2*x - 5)), x)
```

$$3.95 \quad \int \frac{\sqrt{2-3x}\sqrt{7+5x}}{\sqrt{-5+2x}\sqrt{1+4x}} dx$$

Optimal. Leaf size=365

$$\frac{39\sqrt{\frac{11}{23}}\sqrt{5x+7}\text{EllipticF}\left(\tan^{-1}\left(\frac{\sqrt{4x+1}}{\sqrt{2}\sqrt{2-3x}}\right), -\frac{39}{23}\right)}{8\sqrt{2x-5}\sqrt{\frac{5x+7}{5-2x}}} + \frac{179\sqrt{\frac{11}{62}}\sqrt{2-3x}\text{EllipticF}\left(\tan^{-1}\left(\frac{\sqrt{\frac{22}{23}}\sqrt{5x+7}}{\sqrt{2x-5}}\right), \frac{39}{62}\right)}{16\sqrt{-\frac{2-3x}{4x+1}}\sqrt{4x+1}} + \frac{\sqrt{2-3x}\sqrt{4x+1}}{4\sqrt{2x-5}}$$

[Out] (Sqrt[2 - 3*x]*Sqrt[1 + 4*x]*Sqrt[7 + 5*x])/(4*Sqrt[-5 + 2*x]) - (Sqrt[429]*Sqrt[2 - 3*x]*Sqrt[(7 + 5*x)/(5 - 2*x)]*EllipticE[ArcSin[(Sqrt[39/23]*Sqrt[1 + 4*x])/Sqrt[-5 + 2*x]], -23/39])/(8*Sqrt[(2 - 3*x)/(5 - 2*x)]*Sqrt[7 + 5*x]) - (39*Sqrt[11/23]*Sqrt[7 + 5*x]*EllipticF[ArcTan[Sqrt[1 + 4*x]/(Sqrt[2]*Sqrt[2 - 3*x])], -39/23])/(8*Sqrt[-5 + 2*x]*Sqrt[(7 + 5*x)/(5 - 2*x)]) + (179*Sqrt[11/62]*Sqrt[2 - 3*x]*EllipticF[ArcTan[(Sqrt[22/23]*Sqrt[7 + 5*x])/Sqrt[-5 + 2*x]], 39/62])/(16*Sqrt[-((2 - 3*x)/(1 + 4*x))]*Sqrt[1 + 4*x]) + (4117*Sqrt[2 - 3*x]*EllipticPi[78/55, ArcTan[(Sqrt[22/23]*Sqrt[7 + 5*x])/Sqrt[-5 + 2*x]], 39/62])/(80*Sqrt[682]*Sqrt[-((2 - 3*x)/(1 + 4*x))]*Sqrt[1 + 4*x])

Rubi [A] time = 0.201979, antiderivative size = 365, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 8, integrand size = 37, $\frac{\text{number of rules}}{\text{integrand size}} = 0.216$, Rules used = {173, 176, 424, 170, 418, 165, 536, 539}

$$\frac{\sqrt{2-3x}\sqrt{4x+1}\sqrt{5x+7}}{4\sqrt{2x-5}} - \frac{39\sqrt{\frac{11}{23}}\sqrt{5x+7}F\left(\tan^{-1}\left(\frac{\sqrt{4x+1}}{\sqrt{2}\sqrt{2-3x}}\right)\middle| -\frac{39}{23}\right)}{8\sqrt{2x-5}\sqrt{\frac{5x+7}{5-2x}}} + \frac{179\sqrt{\frac{11}{62}}\sqrt{2-3x}F\left(\tan^{-1}\left(\frac{\sqrt{\frac{22}{23}}\sqrt{5x+7}}{\sqrt{2x-5}}\right)\middle| \frac{39}{62}\right)}{16\sqrt{-\frac{2-3x}{4x+1}}\sqrt{4x+1}} - \frac{\sqrt{2-3x}\sqrt{4x+1}}{4\sqrt{2x-5}}$$

Antiderivative was successfully verified.

[In] Int[(Sqrt[2 - 3*x]*Sqrt[7 + 5*x])/(Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]), x]

[Out] (Sqrt[2 - 3*x]*Sqrt[1 + 4*x]*Sqrt[7 + 5*x])/(4*Sqrt[-5 + 2*x]) - (Sqrt[429]*Sqrt[2 - 3*x]*Sqrt[(7 + 5*x)/(5 - 2*x)]*EllipticE[ArcSin[(Sqrt[39/23]*Sqrt[1 + 4*x])/Sqrt[-5 + 2*x]], -23/39])/(8*Sqrt[(2 - 3*x)/(5 - 2*x)]*Sqrt[7 + 5*x]) - (39*Sqrt[11/23]*Sqrt[7 + 5*x]*EllipticF[ArcTan[Sqrt[1 + 4*x]/(Sqrt[2]*Sqrt[2 - 3*x])], -39/23])/(8*Sqrt[-5 + 2*x]*Sqrt[(7 + 5*x)/(5 - 2*x)]) + (179*Sqrt[11/62]*Sqrt[2 - 3*x]*EllipticF[ArcTan[(Sqrt[22/23]*Sqrt[7 + 5*x])/Sqrt[-5 + 2*x]], 39/62])/(16*Sqrt[-((2 - 3*x)/(1 + 4*x))]*Sqrt[1 + 4*x]) + (4117*Sqrt[2 - 3*x]*EllipticPi[78/55, ArcTan[(Sqrt[22/23]*Sqrt[7 + 5*x])/Sqrt[-5 + 2*x]], 39/62])/(80*Sqrt[682]*Sqrt[-((2 - 3*x)/(1 + 4*x))]*Sqrt[1 + 4*x])

Sqrt[-5 + 2*x]], 39/62)]/(80*Sqrt[682]*Sqrt[-((2 - 3*x)/(1 + 4*x))]*Sqrt[1 + 4*x])

Rule 173

Int[(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)])/(Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Simp[(Sqrt[a + b*x]*Sqrt[c + d*x]*Sqrt[g + h*x])/(h*Sqrt[e + f*x]), x] + (-Dist[((d*e - c*f)*(f*g - e*h))/(2*f*h), Int[Sqrt[a + b*x]/(Sqrt[c + d*x]*(e + f*x)^(3/2)*Sqrt[g + h*x]), x], x] + Dist[((d*e - c*f)*(b*f*g + b*e*h - 2*a*f*h))/(2*f^2*h), Int[1/(Sqrt[a + b*x]*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]), x], x] + Dist[(a*d*f*h - b*(d*f*g + d*e*h - c*f*h))/(2*f^2*h), Int[Sqrt[e + f*x]/(Sqrt[a + b*x]*Sqrt[c + d*x]*Sqrt[g + h*x]), x], x]) /; FreeQ[{a, b, c, d, e, f, g, h}, x]

Rule 176

Int[Sqrt[(c_.) + (d_.)*(x_)]/(((a_.) + (b_.)*(x_))^(3/2)*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Dist[(-2*Sqrt[c + d*x]*Sqrt[-(((b*e - a*f)*(g + h*x))/((f*g - e*h)*(a + b*x)))]/((b*e - a*f)*Sqrt[g + h*x]*Sqrt[((b*e - a*f)*(c + d*x))/((d*e - c*f)*(a + b*x))]), Subst[Int[Sqrt[1 + ((b*c - a*d)*x^2)/(d*e - c*f)]/Sqrt[1 - ((b*g - a*h)*x^2)/(f*g - e*h)], x], x, Sqrt[e + f*x]/Sqrt[a + b*x]], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x]

Rule 424

Int[Sqrt[(a_) + (b_.)*(x_)^2]/Sqrt[(c_) + (d_.)*(x_)^2], x_Symbol] := Simp[(Sqrt[a]*EllipticE[ArcSin[Rt[-(d/c), 2]*x], (b*c)/(a*d)]/(Sqrt[c]*Rt[-(d/c), 2]), x] /; FreeQ[{a, b, c, d}, x] && NegQ[d/c] && GtQ[c, 0] && GtQ[a, 0]

Rule 170

Int[1/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Dist[(2*Sqrt[g + h*x]*Sqrt[((b*e - a*f)*(c + d*x))/((d*e - c*f)*(a + b*x)))]/((f*g - e*h)*Sqrt[c + d*x]*Sqrt[-(((b*e - a*f)*(g + h*x))/((f*g - e*h)*(a + b*x)))]), Subst[Int[1/(Sqrt[1 + ((b*c - a*d)*x^2)/(d*e - c*f)]*Sqrt[1 - ((b*g - a*h)*x^2)/(f*g - e*h)]), x], x, Sqrt[e + f*x]/Sqrt[a + b*x]], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x]

Rule 418

Int[1/(Sqrt[(a_) + (b_.)*(x_)^2]*Sqrt[(c_) + (d_.)*(x_)^2]), x_Symbol] := Simp[(Sqrt[a + b*x^2]*EllipticF[ArcTan[Rt[d/c, 2]*x], 1 - (b*c)/(a*d)]/(a*Rt[d/c, 2]*Sqrt[a + b*x^2]), x] /; FreeQ[{a, b, c, d}, x] && GtQ[a, 0] && GtQ[c, 0]

$\text{t}[d/c, 2] * \text{Sqrt}[c + d*x^2] * \text{Sqrt}[(c*(a + b*x^2))/(a*(c + d*x^2))], x] /;$ FreeQ[{a, b, c, d}, x] && PosQ[d/c] && PosQ[b/a] && !SimplerSqrtQ[b/a, d/c]

Rule 165

$\text{Int}[\text{Sqrt}[(a_.) + (b_.)*(x_.)]/(\text{Sqrt}[(c_.) + (d_.)*(x_.)] * \text{Sqrt}[(e_.) + (f_.)*(x_.)] * \text{Sqrt}[(g_.) + (h_.)*(x_.)]), x_Symbol] \rightarrow \text{Dist}[(2*(a + b*x) * \text{Sqrt}[(b*g - a*h)*(c + d*x)]/((d*g - c*h)*(a + b*x))] * \text{Sqrt}[(b*g - a*h)*(e + f*x)]/((f*g - e*h)*(a + b*x))]/(\text{Sqrt}[c + d*x] * \text{Sqrt}[e + f*x]), \text{Subst}[\text{Int}[1/((h - b*x^2) * \text{Sqrt}[1 + ((b*c - a*d)*x^2]/(d*g - c*h))] * \text{Sqrt}[1 + ((b*e - a*f)*x^2)/(f*g - e*h)]], x], x, \text{Sqrt}[g + h*x]/\text{Sqrt}[a + b*x]], x] /;$ FreeQ[{a, b, c, d, e, f, g, h}, x]

Rule 536

$\text{Int}[1/(((a_.) + (b_.)*(x_.)^2) * \text{Sqrt}[(c_.) + (d_.)*(x_.)^2] * \text{Sqrt}[(e_.) + (f_.)*(x_.)^2]), x_Symbol] \rightarrow -\text{Dist}[f/(b*e - a*f), \text{Int}[1/(\text{Sqrt}[c + d*x^2] * \text{Sqrt}[e + f*x^2]), x], x] + \text{Dist}[b/(b*e - a*f), \text{Int}[\text{Sqrt}[e + f*x^2]/((a + b*x^2) * \text{Sqrt}[c + d*x^2]), x], x] /;$ FreeQ[{a, b, c, d, e, f}, x] && GtQ[d/c, 0] && GtQ[f/e, 0] && !SimplerSqrtQ[d/c, f/e]

Rule 539

$\text{Int}[\text{Sqrt}[(c_.) + (d_.)*(x_.)^2]/(((a_.) + (b_.)*(x_.)^2) * \text{Sqrt}[(e_.) + (f_.)*(x_.)^2]), x_Symbol] \rightarrow \text{Simp}[(c * \text{Sqrt}[e + f*x^2] * \text{EllipticPi}[1 - (b*c)/(a*d), \text{ArcTan}[\text{Rt}[d/c, 2]*x], 1 - (c*f)/(d*e)])/ (a*e * \text{Rt}[d/c, 2] * \text{Sqrt}[c + d*x^2] * \text{Sqrt}[(c*(e + f*x^2))/(e*(c + d*x^2))]), x] /;$ FreeQ[{a, b, c, d, e, f}, x] && PosQ[d/c]

Rubi steps

$$\begin{aligned}
\int \frac{\sqrt{2-3x}\sqrt{7+5x}}{\sqrt{-5+2x}\sqrt{1+4x}} dx &= \frac{\sqrt{2-3x}\sqrt{1+4x}\sqrt{7+5x}}{4\sqrt{-5+2x}} - \frac{179}{16} \int \frac{\sqrt{-5+2x}}{\sqrt{2-3x}\sqrt{1+4x}\sqrt{7+5x}} dx - \frac{429}{16} \int \frac{1}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}} dx \\
&= \frac{\sqrt{2-3x}\sqrt{1+4x}\sqrt{7+5x}}{4\sqrt{-5+2x}} - \frac{(6981\sqrt{-\frac{2-3x}{-5+2x}}(-5+2x)\sqrt{\frac{1+4x}{-5+2x}}) \text{Subst} \left(\int \frac{1}{(5-2x^2)\sqrt{1+\frac{11x^2}{31}\sqrt{1+\frac{2x}{7}}}} dx \right)}{8\sqrt{713}\sqrt{2-3x}\sqrt{1+4x}} \\
&= \frac{\sqrt{2-3x}\sqrt{1+4x}\sqrt{7+5x}}{4\sqrt{-5+2x}} - \frac{\sqrt{429}\sqrt{2-3x}\sqrt{\frac{7+5x}{5-2x}} E \left(\sin^{-1} \left(\frac{\sqrt{\frac{39}{23}}\sqrt{1+4x}}{\sqrt{-5+2x}} \right) \middle| -\frac{23}{39} \right)}{8\sqrt{\frac{2-3x}{5-2x}}\sqrt{7+5x}} - \frac{39\sqrt{\frac{11}{23}}\sqrt{7+5x}}{8\sqrt{-5+2x}} \\
&= \frac{\sqrt{2-3x}\sqrt{1+4x}\sqrt{7+5x}}{4\sqrt{-5+2x}} - \frac{\sqrt{429}\sqrt{2-3x}\sqrt{\frac{7+5x}{5-2x}} E \left(\sin^{-1} \left(\frac{\sqrt{\frac{39}{23}}\sqrt{1+4x}}{\sqrt{-5+2x}} \right) \middle| -\frac{23}{39} \right)}{8\sqrt{\frac{2-3x}{5-2x}}\sqrt{7+5x}} - \frac{39\sqrt{\frac{11}{23}}\sqrt{7+5x}}{8\sqrt{-5+2x}}
\end{aligned}$$

Mathematica [A] time = 1.36944, size = 347, normalized size = 0.95

$$\frac{-1265\sqrt{341}\sqrt{\frac{3x-2}{4x+1}}\sqrt{\frac{5x+7}{4x+1}}(8x^2-18x-5)\text{EllipticF}\left(\sin^{-1}\left(\sqrt{\frac{22}{39}}\sqrt{\frac{5x+7}{4x+1}}\right),\frac{39}{62}\right)+6820\sqrt{341}\sqrt{\frac{3x-2}{4x+1}}\sqrt{\frac{5x+7}{4x+1}}(8x^2-18x-5)\text{EllipticE}\left(\sin^{-1}\left(\sqrt{\frac{22}{39}}\sqrt{\frac{5x+7}{4x+1}}\right),\frac{39}{62}\right)}{27280\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}\sqrt{7+5x}}$$

Warning: Unable to verify antiderivative.

[In] Integrate[(Sqrt[2 - 3*x]*Sqrt[7 + 5*x])/(Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]),x]

[Out] $-(6820\sqrt{341}\sqrt{(-2+3x)/(1+4x)}\sqrt{(7+5x)/(1+4x)}*(-5-18x+8x^2)\text{EllipticE}[\text{ArcSin}[\sqrt{22/39}\sqrt{(7+5x)/(1+4x)}]], 39/62 - 1265\sqrt{341}\sqrt{(-2+3x)/(1+4x)}\sqrt{(7+5x)/(1+4x)}*(-5-18x+8x^2)\text{EllipticF}[\text{ArcSin}[\sqrt{22/39}\sqrt{(7+5x)/(1+4x)}]], 39/62) + \sqrt{(-5+2x)/(1+4x)}*(13640\sqrt{2}*(70-83x-53x^2+30x^3) + 4117\sqrt{341}\sqrt{(-2+3x)/(1+4x)}*(1+4x)^2\sqrt{(-35-11x+10x^2)/(1+4x)^2}\text{EllipticPi}[78/55, \text{ArcSin}[\sqrt{22/39}\sqrt{(7+5x)/(1+4x)}]], 39/62)))/(27280\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}\sqrt{7+5x})$

Maple [A] time = 0.023, size = 875, normalized size = 2.4

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] $\text{int}((7+5*x)^{(1/2)}*(2-3*x)^{(1/2)}/(2*x-5)^{(1/2)}/(4*x+1)^{(1/2)}, x)$

[Out] $\frac{1}{34320}*(7+5*x)^{(1/2)}*(2-3*x)^{(1/2)}*(2*x-5)^{(1/2)}*(4*x+1)^{(1/2)}*(20240*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}*3^{(1/2)}*13^{(1/2)}*((2*x-5)/(4*x+1))^{(1/2)}*((-2+3*x)/(4*x+1))^{(1/2)}*x^2*\text{EllipticF}(1/31*31^{(1/2)}*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}, 1/39*31^{(1/2)}*78^{(1/2)})+65872*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}*3^{(1/2)}*13^{(1/2)}*((2*x-5)/(4*x+1))^{(1/2)}*((-2+3*x)/(4*x+1))^{(1/2)}*x^2*\text{EllipticPi}(1/31*31^{(1/2)}*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}, 124/55, 1/39*31^{(1/2)}*78^{(1/2)})+68640*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}*3^{(1/2)}*13^{(1/2)}*((2*x-5)/(4*x+1))^{(1/2)}*((-2+3*x)/(4*x+1))^{(1/2)}*x^2*\text{EllipticE}(1/31*31^{(1/2)}*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}, 1/39*31^{(1/2)}*78^{(1/2)})+10120*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}*3^{(1/2)}*13^{(1/2)}*((2*x-5)/(4*x+1))^{(1/2)}*((-2+3*x)/(4*x+1))^{(1/2)}*x*\text{EllipticF}(1/31*31^{(1/2)}*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}, 1/39*31^{(1/2)}*78^{(1/2)})+32936*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}*3^{(1/2)}*13^{(1/2)}*((2*x-5)/(4*x+1))^{(1/2)}*((-2+3*x)/(4*x+1))^{(1/2)}*x*\text{EllipticPi}(1/31*31^{(1/2)}*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}, 124/55, 1/39*31^{(1/2)}*78^{(1/2)})+34320*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}*3^{(1/2)}*13^{(1/2)}*((2*x-5)/(4*x+1))^{(1/2)}*((-2+3*x)/(4*x+1))^{(1/2)}*x*\text{EllipticE}(1/31*31^{(1/2)}*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}, 1/39*31^{(1/2)}*78^{(1/2)})+1265*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}*3^{(1/2)}*13^{(1/2)}*((2*x-5)/(4*x+1))^{(1/2)}*((-2+3*x)/(4*x+1))^{(1/2)}*\text{EllipticF}(1/31*31^{(1/2)}*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}, 1/39*31^{(1/2)}*78^{(1/2)})+4117*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}*3^{(1/2)}*13^{(1/2)}*((2*x-5)/(4*x+1))^{(1/2)}*((-2+3*x)/(4*x+1))^{(1/2)}*\text{EllipticPi}(1/31*31^{(1/2)}*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}, 124/55, 1/39*31^{(1/2)}*78^{(1/2)})+4290*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}*3^{(1/2)}*13^{(1/2)}*((2*x-5)/(4*x+1))^{(1/2)}*((-2+3*x)/(4*x+1))^{(1/2)}*\text{EllipticE}(1/31*31^{(1/2)}*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}, 1/39*31^{(1/2)}*78^{(1/2)})+514800*x^3-909480*x^2-1424280*x+1201200)/(120*x^4-182*x^3-385*x^2+197*x+70)$

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{5x+7}\sqrt{-3x+2}}{\sqrt{4x+1}\sqrt{2x-5}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((7+5*x)^(1/2)*(2-3*x)^(1/2)/(-5+2*x)^(1/2)/(1+4*x)^(1/2),x, algorith="maxima")

[Out] integrate(sqrt(5*x + 7)*sqrt(-3*x + 2)/(sqrt(4*x + 1)*sqrt(2*x - 5)), x)

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{5x+7}\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2}}{8x^2-18x-5}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((7+5*x)^(1/2)*(2-3*x)^(1/2)/(-5+2*x)^(1/2)/(1+4*x)^(1/2),x, algorith="fricas")

[Out] integral(sqrt(5*x + 7)*sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)/(8*x^2 - 18*x - 5), x)

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{2-3x}\sqrt{5x+7}}{\sqrt{2x-5}\sqrt{4x+1}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((7+5*x)**(1/2)*(2-3*x)**(1/2)/(-5+2*x)**(1/2)/(1+4*x)**(1/2),x)

[Out] Integral(sqrt(2 - 3*x)*sqrt(5*x + 7)/(sqrt(2*x - 5)*sqrt(4*x + 1)), x)

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{5x+7}\sqrt{-3x+2}}{\sqrt{4x+1}\sqrt{2x-5}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((7+5*x)^(1/2)*(2-3*x)^(1/2)/(-5+2*x)^(1/2)/(1+4*x)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(sqrt(5*x + 7)*sqrt(-3*x + 2)/(sqrt(4*x + 1)*sqrt(2*x - 5)), x)
```

$$3.96 \quad \int \frac{\sqrt{2-3x}}{\sqrt{-5+2x}\sqrt{1+4x}\sqrt{7+5x}} dx$$

Optimal. Leaf size=101

$$\frac{62(2-3x)\sqrt{\frac{5-2x}{2-3x}}\sqrt{\frac{4x+1}{2-3x}}\Pi\left(-\frac{69}{55}; \sin^{-1}\left(\frac{\sqrt{\frac{11}{23}}\sqrt{5x+7}}{\sqrt{2-3x}}\right) \middle| -\frac{23}{39}\right)}{5\sqrt{429}\sqrt{2x-5}\sqrt{4x+1}}$$

[Out] (62*(2 - 3*x)*Sqrt[(5 - 2*x)/(2 - 3*x)]*Sqrt[-((1 + 4*x)/(2 - 3*x))]*EllipticPi[-69/55, ArcSin[(Sqrt[11/23]*Sqrt[7 + 5*x])/Sqrt[2 - 3*x]], -23/39])/(5*Sqrt[429]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])

Rubi [A] time = 0.0371325, antiderivative size = 101, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 37, $\frac{\text{number of rules}}{\text{integrand size}} = 0.054$, Rules used = {165, 537}

$$\frac{62(2-3x)\sqrt{\frac{5-2x}{2-3x}}\sqrt{\frac{4x+1}{2-3x}}\Pi\left(-\frac{69}{55}; \sin^{-1}\left(\frac{\sqrt{\frac{11}{23}}\sqrt{5x+7}}{\sqrt{2-3x}}\right) \middle| -\frac{23}{39}\right)}{5\sqrt{429}\sqrt{2x-5}\sqrt{4x+1}}$$

Antiderivative was successfully verified.

[In] Int[Sqrt[2 - 3*x]/(Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*Sqrt[7 + 5*x]), x]

[Out] (62*(2 - 3*x)*Sqrt[(5 - 2*x)/(2 - 3*x)]*Sqrt[-((1 + 4*x)/(2 - 3*x))]*EllipticPi[-69/55, ArcSin[(Sqrt[11/23]*Sqrt[7 + 5*x])/Sqrt[2 - 3*x]], -23/39])/(5*Sqrt[429]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])

Rule 165

Int[Sqrt[(a_.) + (b_.)*(x_.)]/(Sqrt[(c_.) + (d_.)*(x_.)]*Sqrt[(e_.) + (f_.)*(x_.)]*Sqrt[(g_.) + (h_.)*(x_.)]), x_Symbol] := Dist[(2*(a + b*x)*Sqrt[((b*g - a*h)*(c + d*x))/((d*g - c*h)*(a + b*x))]*Sqrt[((b*g - a*h)*(e + f*x))/((f*g - e*h)*(a + b*x))])/(Sqrt[c + d*x]*Sqrt[e + f*x]), Subst[Int[1/((h - b*x^2)*Sqrt[1 + ((b*c - a*d)*x^2]/(d*g - c*h)]*Sqrt[1 + ((b*e - a*f)*x^2)/(f*g - e*h)]), x], x, Sqrt[g + h*x]/Sqrt[a + b*x], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x]

Rule 537

```
Int[1/(((a_) + (b_.)*(x_)^2)*Sqrt[(c_) + (d_.)*(x_)^2]*Sqrt[(e_) + (f_.)*(x_)^2]), x_Symbol] :> Simp[(1*EllipticPi[(b*c)/(a*d), ArcSin[Rt[-(d/c), 2]*x], (c*f)/(d*e)])/(a*Sqrt[c]*Sqrt[e]*Rt[-(d/c), 2]), x] /; FreeQ[{a, b, c, d, e, f}, x] && !GtQ[d/c, 0] && GtQ[c, 0] && GtQ[e, 0] && !( !GtQ[f/e, 0] && SimplerSqrtQ[-(f/e), -(d/c)])]
```

Rubi steps

$$\int \frac{\sqrt{2-3x}}{\sqrt{-5+2x}\sqrt{1+4x}\sqrt{7+5x}} dx = \frac{(62(2-3x)\sqrt{-\frac{5+2x}{2-3x}}\sqrt{-\frac{1+4x}{2-3x}}) \text{Subst}\left(\int \frac{1}{\sqrt{1-\frac{11x^2}{23}}\sqrt{1+\frac{11x^2}{39}(5+3x^2)}} dx, x, \frac{\sqrt{7+5x}}{\sqrt{2-3x}}\right)}{\sqrt{897}\sqrt{-5+2x}\sqrt{1+4x}}$$

$$= \frac{62(2-3x)\sqrt{\frac{5-2x}{2-3x}}\sqrt{-\frac{1+4x}{2-3x}}\Pi\left(-\frac{69}{55}; \sin^{-1}\left(\frac{\sqrt{\frac{11}{23}}\sqrt{7+5x}}{\sqrt{2-3x}}\right) \middle| -\frac{23}{39}\right)}{5\sqrt{429}\sqrt{-5+2x}\sqrt{1+4x}}$$

Mathematica [A] time = 0.546155, size = 170, normalized size = 1.68

$$\frac{\sqrt{\frac{4x+1}{5x+7}}(5x+7)^{3/2}\left(117\sqrt{\frac{-6x^2+19x-10}{(5x+7)^2}}\Pi\left(-\frac{55}{62}; \sin^{-1}\left(\sqrt{\frac{155-62x}{55x+77}}\right) \middle| \frac{23}{62}\right) - 62\sqrt{\frac{5-2x}{5x+7}}\sqrt{\frac{3x-2}{5x+7}}\text{EllipticF}\left(\sin^{-1}\left(\sqrt{\frac{155-62x}{55x+77}}\right), \frac{23}{62}\right)\right)}{5\sqrt{682}\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}}$$

Warning: Unable to verify antiderivative.

[In] Integrate[Sqrt[2 - 3*x]/(Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*Sqrt[7 + 5*x]), x]

[Out] (Sqrt[(1 + 4*x)/(7 + 5*x)]*(7 + 5*x)^(3/2)*(-62*Sqrt[(5 - 2*x)/(7 + 5*x)]*Sqrt[(-2 + 3*x)/(7 + 5*x)]*EllipticF[ArcSin[Sqrt[(155 - 62*x)/(77 + 55*x)]], 23/62] + 117*Sqrt[(-10 + 19*x - 6*x^2)/(7 + 5*x)^2]*EllipticPi[-55/62, ArcSin[Sqrt[(155 - 62*x)/(77 + 55*x)]], 23/62]))/(5*Sqrt[682]*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])

Maple [B] time = 0.025, size = 172, normalized size = 1.7

$$\frac{\sqrt{13}\sqrt{3}\sqrt{11}}{128700x^3 - 227370x^2 - 356070x + 300300}\left(55\text{EllipticF}\left(\frac{1}{31}\sqrt{31}\sqrt{11}\sqrt{\frac{7+5x}{4x+1}}, \frac{1}{39}\sqrt{31}\sqrt{78}\right) + 69\text{EllipticPi}\left(\frac{1}{3}\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `int((2-3*x)^(1/2)/(7+5*x)^(1/2)/(2*x-5)^(1/2)/(4*x+1)^(1/2),x)`

[Out] $\frac{1}{4290} \cdot (55 \cdot \text{EllipticF}\left(\frac{1}{31} \cdot 31^{1/2} \cdot 11^{1/2} \cdot \left(\frac{7+5x}{4x+1}\right)^{1/2}, \frac{1}{39} \cdot 31^{1/2} \cdot 78^{1/2}\right) + 69 \cdot \text{EllipticPi}\left(\frac{1}{31} \cdot 31^{1/2} \cdot 11^{1/2} \cdot \left(\frac{7+5x}{4x+1}\right)^{1/2}, \frac{124}{55}, \frac{1}{39} \cdot 31^{1/2} \cdot 78^{1/2}\right)) \cdot \left(\frac{-2+3x}{4x+1}\right)^{1/2} \cdot \left(\frac{2x-5}{4x+1}\right)^{1/2} \cdot 13^{1/2} \cdot 3^{1/2} \cdot \left(\frac{7+5x}{4x+1}\right)^{1/2} \cdot 11^{1/2} \cdot (4x+1)^{3/2} \cdot (2x-5)^{1/2} \cdot (7+5x)^{1/2} \cdot (2-3x)^{1/2} / (30x^3 - 53x^2 - 83x + 70)$

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{-3x+2}}{\sqrt{5x+7}\sqrt{4x+1}\sqrt{2x-5}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((2-3*x)^(1/2)/(7+5*x)^(1/2)/(-5+2*x)^(1/2)/(1+4*x)^(1/2),x, algorithm="maxima")`

[Out] `integrate(sqrt(-3*x + 2)/(sqrt(5*x + 7)*sqrt(4*x + 1)*sqrt(2*x - 5)), x)`

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{5x+7}\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2}}{40x^3 - 34x^2 - 151x - 35}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((2-3*x)^(1/2)/(7+5*x)^(1/2)/(-5+2*x)^(1/2)/(1+4*x)^(1/2),x, algorithm="fricas")`

[Out] `integral(sqrt(5*x + 7)*sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)/(40*x^3 - 34*x^2 - 151*x - 35), x)`

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{2-3x}}{\sqrt{2x-5}\sqrt{4x+1}\sqrt{5x+7}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2-3*x)**(1/2)/(7+5*x)**(1/2)/(-5+2*x)**(1/2)/(1+4*x)**(1/2),x)

[Out] Integral(sqrt(2 - 3*x)/(sqrt(2*x - 5)*sqrt(4*x + 1)*sqrt(5*x + 7)), x)

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{-3x+2}}{\sqrt{5x+7}\sqrt{4x+1}\sqrt{2x-5}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2-3*x)^(1/2)/(7+5*x)^(1/2)/(-5+2*x)^(1/2)/(1+4*x)^(1/2),x, algorithm="giac")

[Out] integrate(sqrt(-3*x + 2)/(sqrt(5*x + 7)*sqrt(4*x + 1)*sqrt(2*x - 5)), x)

$$3.97 \quad \int \frac{\sqrt{2-3x}}{\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^{3/2}} dx$$

Optimal. Leaf size=60

$$\frac{2\sqrt{\frac{11}{39}}\sqrt{5-2x}E\left(\sin^{-1}\left(\frac{\sqrt{\frac{39}{22}}\sqrt{4x+1}}{\sqrt{5x+7}}\right)\middle|\frac{62}{39}\right)}{23\sqrt{2x-5}}$$

[Out] (2*Sqrt[11/39]*Sqrt[5 - 2*x]*EllipticE[ArcSin[(Sqrt[39/22]*Sqrt[1 + 4*x])/Sqrt[7 + 5*x]], 62/39])/(23*Sqrt[-5 + 2*x])

Rubi [B] time = 0.130884, antiderivative size = 195, normalized size of antiderivative = 3.25, number of steps used = 5, number of rules used = 5, integrand size = 37, $\frac{\text{number of rules}}{\text{integrand size}} = 0.135$, Rules used = {176, 422, 418, 492, 411}

$$\frac{62\sqrt{2x-5}\sqrt{4x+1}}{897\sqrt{2-3x}\sqrt{5x+7}} - \frac{\sqrt{\frac{22}{31}}\sqrt{4x+1}E\left(\tan^{-1}\left(\frac{\sqrt{\frac{31}{11}}\sqrt{2x-5}}{\sqrt{5x+7}}\right)\middle|\frac{39}{62}\right)}{39\sqrt{2-3x}\sqrt{-\frac{4x+1}{2-3x}}} + \frac{2\sqrt{682}\sqrt{4x+1}E\left(\tan^{-1}\left(\frac{\sqrt{\frac{31}{11}}\sqrt{2x-5}}{\sqrt{5x+7}}\right)\middle|\frac{39}{62}\right)}{897\sqrt{2-3x}\sqrt{-\frac{4x+1}{2-3x}}}$$

Antiderivative was successfully verified.

[In] Int[Sqrt[2 - 3*x]/(Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(7 + 5*x)^(3/2)), x]

[Out] (-62*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/(897*Sqrt[2 - 3*x]*Sqrt[7 + 5*x]) + (2*Sqrt[682]*Sqrt[1 + 4*x]*EllipticE[ArcTan[(Sqrt[31/11]*Sqrt[-5 + 2*x])/Sqrt[7 + 5*x]], 39/62])/(897*Sqrt[2 - 3*x]*Sqrt[-((1 + 4*x)/(2 - 3*x))]) - (Sqrt[22/31]*Sqrt[1 + 4*x]*EllipticF[ArcTan[(Sqrt[31/11]*Sqrt[-5 + 2*x])/Sqrt[7 + 5*x]], 39/62])/(39*Sqrt[2 - 3*x]*Sqrt[-((1 + 4*x)/(2 - 3*x))])

Rule 176

Int[Sqrt[(c_.) + (d_.)*(x_)]/(((a_.) + (b_.)*(x_))^(3/2)*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Dist[(-2*Sqrt[c + d*x]*Sqrt[-((b*e - a*f)*(g + h*x))/((f*g - e*h)*(a + b*x))])]/((b*e - a*f)*Sqrt[g + h*x]*Sqrt[((b*e - a*f)*(c + d*x))/((d*e - c*f)*(a + b*x))]), Subst[Int[Sqrt[1 + ((b*c - a*d)*x^2)/(d*e - c*f)]/Sqrt[1 - ((b*g - a*h)*x^2)/(f*g - e*h)], x], x, Sqrt[e + f*x]/Sqrt[a + b*x], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x]

Rule 422

```
Int[Sqrt[(a_) + (b_.)*(x_)^2]/Sqrt[(c_) + (d_.)*(x_)^2], x_Symbol] := Dist[
a, Int[1/(Sqrt[a + b*x^2]*Sqrt[c + d*x^2]), x], x] + Dist[b, Int[x^2/(Sqrt[
a + b*x^2]*Sqrt[c + d*x^2]), x], x] /; FreeQ[{a, b, c, d}, x] && PosQ[d/c]
&& PosQ[b/a]
```

Rule 418

```
Int[1/(Sqrt[(a_) + (b_.)*(x_)^2]*Sqrt[(c_) + (d_.)*(x_)^2]), x_Symbol] := S
imp[(Sqrt[a + b*x^2]*EllipticF[ArcTan[Rt[d/c, 2]*x], 1 - (b*c)/(a*d)]/(a*R
t[d/c, 2]*Sqrt[c + d*x^2]*Sqrt[(c*(a + b*x^2))/(a*(c + d*x^2))]), x] /; Fre
eQ[{a, b, c, d}, x] && PosQ[d/c] && PosQ[b/a] && !SimplerSqrtQ[b/a, d/c]
```

Rule 492

```
Int[(x_)^2/(Sqrt[(a_) + (b_.)*(x_)^2]*Sqrt[(c_) + (d_.)*(x_)^2]), x_Symbol]
:= Simp[(x*Sqrt[a + b*x^2])/(b*Sqrt[c + d*x^2]), x] - Dist[c/b, Int[Sqrt[a
+ b*x^2]/(c + d*x^2)^(3/2), x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c -
a*d, 0] && PosQ[b/a] && PosQ[d/c] && !SimplerSqrtQ[b/a, d/c]
```

Rule 411

```
Int[Sqrt[(a_) + (b_.)*(x_)^2]/((c_) + (d_.)*(x_)^2)^(3/2), x_Symbol] := Sim
p[(Sqrt[a + b*x^2]*EllipticE[ArcTan[Rt[d/c, 2]*x], 1 - (b*c)/(a*d)]/(c*Rt[
d/c, 2]*Sqrt[c + d*x^2]*Sqrt[(c*(a + b*x^2))/(a*(c + d*x^2))]), x] /; FreeQ
[{a, b, c, d}, x] && PosQ[b/a] && PosQ[d/c]
```

Rubi steps

$$\begin{aligned}
\int \frac{\sqrt{2-3x}}{\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^{3/2}} dx &= \frac{\left(\sqrt{2}\sqrt{2-3x}\sqrt{\frac{1+4x}{7+5x}}\right) \text{Subst}\left(\int \frac{\sqrt{1+\frac{31x^2}{11}}}{\sqrt{1+\frac{23x^2}{22}}} dx, x, \frac{\sqrt{-5+2x}}{\sqrt{7+5x}}\right)}{39\sqrt{1+4x}\sqrt{-\frac{2-3x}{7+5x}}} \\
&= \frac{\left(\sqrt{2}\sqrt{2-3x}\sqrt{\frac{1+4x}{7+5x}}\right) \text{Subst}\left(\int \frac{1}{\sqrt{1+\frac{23x^2}{22}}\sqrt{1+\frac{31x^2}{11}}} dx, x, \frac{\sqrt{-5+2x}}{\sqrt{7+5x}}\right)}{39\sqrt{1+4x}\sqrt{-\frac{2-3x}{7+5x}}} + \frac{\left(31\sqrt{2}\sqrt{2-3x}\sqrt{\frac{1+4x}{7+5x}}\right) \text{Subst}\left(\int \frac{1}{\sqrt{1+\frac{23x^2}{22}}\sqrt{1+\frac{31x^2}{11}}} dx, x, \frac{\sqrt{-5+2x}}{\sqrt{7+5x}}\right)}{39\sqrt{1+4x}\sqrt{-\frac{2-3x}{7+5x}}} \\
&= -\frac{62\sqrt{-5+2x}\sqrt{1+4x}}{897\sqrt{2-3x}\sqrt{7+5x}} - \frac{\sqrt{\frac{22}{31}}\sqrt{1+4x}F\left(\tan^{-1}\left(\frac{\sqrt{\frac{31}{11}}\sqrt{-5+2x}}{\sqrt{7+5x}}\right)\middle|\frac{39}{62}\right)}{39\sqrt{2-3x}\sqrt{-\frac{1+4x}{2-3x}}} - \frac{\left(62\sqrt{2}\sqrt{2-3x}\sqrt{\frac{1+4x}{7+5x}}\right) \text{Subst}\left(\int \frac{1}{\sqrt{1+\frac{23x^2}{22}}\sqrt{1+\frac{31x^2}{11}}} dx, x, \frac{\sqrt{-5+2x}}{\sqrt{7+5x}}\right)}{39\sqrt{1+4x}\sqrt{-\frac{2-3x}{7+5x}}} \\
&= -\frac{62\sqrt{-5+2x}\sqrt{1+4x}}{897\sqrt{2-3x}\sqrt{7+5x}} + \frac{2\sqrt{682}\sqrt{1+4x}E\left(\tan^{-1}\left(\frac{\sqrt{\frac{31}{11}}\sqrt{-5+2x}}{\sqrt{7+5x}}\right)\middle|\frac{39}{62}\right)}{897\sqrt{2-3x}\sqrt{-\frac{1+4x}{2-3x}}} - \frac{\sqrt{\frac{22}{31}}\sqrt{1+4x}}{39\sqrt{2-3x}\sqrt{-\frac{1+4x}{2-3x}}}
\end{aligned}$$

Mathematica [B] time = 1.72862, size = 237, normalized size = 3.95

$$\frac{\sqrt{2x-5}\sqrt{4x+1}\left(-23\sqrt{682}\sqrt{\frac{8x^2-18x-5}{(2-3x)^2}}(15x^2+11x-14)\text{EllipticF}\left(\sin^{-1}\left(\sqrt{\frac{31}{39}}\sqrt{\frac{2x-5}{3x-2}}\right), \frac{39}{62}\right)-1922\sqrt{\frac{5x+7}{3x-2}}(8x^2-18x+8)\right)}{27807\sqrt{2-3x}\sqrt{5x+7}\sqrt{\frac{5x+7}{3x-2}}(8x^2-18x-5)}$$

Antiderivative was successfully verified.

[In] Integrate[Sqrt[2 - 3*x]/(Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(7 + 5*x)^(3/2)), x]

[Out] (Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(-1922*Sqrt[(7 + 5*x)/(-2 + 3*x)]*(-5 - 18*x + 8*x^2) + 62*Sqrt[682]*Sqrt[(-5 - 18*x + 8*x^2)/(2 - 3*x)^2]*(-14 + 11*x + 15*x^2)*EllipticE[ArcSin[Sqrt[31/39]*Sqrt[(-5 + 2*x)/(-2 + 3*x)]]], 39/62) - 23*Sqrt[682]*Sqrt[(-5 - 18*x + 8*x^2)/(2 - 3*x)^2]*(-14 + 11*x + 15*x^2)*EllipticF[ArcSin[Sqrt[31/39]*Sqrt[(-5 + 2*x)/(-2 + 3*x)]]], 39/62))/(27807*Sqrt[2 - 3*x]*Sqrt[7 + 5*x]*Sqrt[(7 + 5*x)/(-2 + 3*x)]*(-5 - 18*x + 8*x^2))

Maple [B] time = 0.025, size = 330, normalized size = 5.5

$$\frac{2}{107640x^4 - 163254x^3 - 345345x^2 + 176709x + 62790} \sqrt{2-3x} \sqrt{2x-5} \sqrt{4x+1} \sqrt{7+5x} \left(16\sqrt{11} \sqrt{\frac{7+5x}{4x+1}} \sqrt{3} \sqrt{13} \sqrt{\frac{2}{4}} \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((2-3*x)^(1/2)/(7+5*x)^(3/2)/(2*x-5)^(1/2)/(4*x+1)^(1/2), x)

[Out] 2/897*(2-3*x)^(1/2)*(7+5*x)^(1/2)*(2*x-5)^(1/2)*(4*x+1)^(1/2)*(16*11^(1/2)*((7+5*x)/(4*x+1))^(1/2)*3^(1/2)*13^(1/2)*((2*x-5)/(4*x+1))^(1/2)*((-2+3*x)/(4*x+1))^(1/2)*x^2*EllipticE(1/31*31^(1/2)*11^(1/2)*((7+5*x)/(4*x+1))^(1/2), 1/39*31^(1/2)*78^(1/2))+8*11^(1/2)*((7+5*x)/(4*x+1))^(1/2)*3^(1/2)*13^(1/2)*((2*x-5)/(4*x+1))^(1/2)*((-2+3*x)/(4*x+1))^(1/2)*x*EllipticE(1/31*31^(1/2)*11^(1/2)*((7+5*x)/(4*x+1))^(1/2), 1/39*31^(1/2)*78^(1/2))+11^(1/2)*((7+5*x)/(4*x+1))^(1/2)*3^(1/2)*13^(1/2)*((2*x-5)/(4*x+1))^(1/2)*((-2+3*x)/(4*x+1))^(1/2)*EllipticE(1/31*31^(1/2)*11^(1/2)*((7+5*x)/(4*x+1))^(1/2), 1/39*31^(1/2)*78^(1/2))+138*x^2-437*x+230)/(120*x^4-182*x^3-385*x^2+197*x+70)

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{-3x+2}}{(5x+7)^2 \sqrt{4x+1} \sqrt{2x-5}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2-3*x)^(1/2)/(7+5*x)^(3/2)/(-5+2*x)^(1/2)/(1+4*x)^(1/2), x, algorithm="maxima")

[Out] integrate(sqrt(-3*x + 2)/((5*x + 7)^(3/2)*sqrt(4*x + 1)*sqrt(2*x - 5)), x)

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral} \left(\frac{\sqrt{5x+7} \sqrt{4x+1} \sqrt{2x-5} \sqrt{-3x+2}}{200x^4 + 110x^3 - 993x^2 - 1232x - 245}, x \right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((2-3*x)^(1/2)/(7+5*x)^(3/2)/(-5+2*x)^(1/2)/(1+4*x)^(1/2),x, algor
ithm="fricas")
```

```
[Out] integral(sqrt(5*x + 7)*sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)/(200*x^4
+ 110*x^3 - 993*x^2 - 1232*x - 245), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((2-3*x)**(1/2)/(7+5*x)**(3/2)/(-5+2*x)**(1/2)/(1+4*x)**(1/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{-3x+2}}{(5x+7)^2 \sqrt{4x+1} \sqrt{2x-5}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((2-3*x)^(1/2)/(7+5*x)^(3/2)/(-5+2*x)^(1/2)/(1+4*x)^(1/2),x, algor
ithm="giac")
```

```
[Out] integrate(sqrt(-3*x + 2)/((5*x + 7)^(3/2)*sqrt(4*x + 1)*sqrt(2*x - 5)), x)
```

$$3.98 \quad \int \frac{\sqrt{2-3x}}{\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^{5/2}} dx$$

Optimal. Leaf size=290

$$\frac{716\sqrt{\frac{11}{23}}\sqrt{5x+7}\text{EllipticF}\left(\tan^{-1}\left(\frac{\sqrt{4x+1}}{\sqrt{2}\sqrt{2-3x}}\right), -\frac{39}{23}\right)}{61893\sqrt{2x-5}\sqrt{\frac{5x+7}{5-2x}}} + \frac{39332\sqrt{2-3x}\sqrt{4x+1}\sqrt{5x+7}}{74828637\sqrt{2x-5}} - \frac{98330\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}}{74828637\sqrt{5x+7}}$$

```
[Out] (-10*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/(2691*(7 + 5*x)^(3/2)) - (
98330*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/(74828637*Sqrt[7 + 5*x])
+ (39332*Sqrt[2 - 3*x]*Sqrt[1 + 4*x]*Sqrt[7 + 5*x])/(74828637*Sqrt[-5 + 2*x
]) - (19666*Sqrt[11/39]*Sqrt[2 - 3*x]*Sqrt[(7 + 5*x)/(5 - 2*x)]*EllipticE[A
rcSin[(Sqrt[39/23]*Sqrt[1 + 4*x])/Sqrt[-5 + 2*x]], -23/39])/(1918683*Sqrt[(
2 - 3*x)/(5 - 2*x)]*Sqrt[7 + 5*x]) + (716*Sqrt[11/23]*Sqrt[7 + 5*x]*Ellipti
cF[ArcTan[Sqrt[1 + 4*x]/(Sqrt[2]*Sqrt[2 - 3*x])], -39/23])/(61893*Sqrt[-5 +
2*x]*Sqrt[(7 + 5*x)/(5 - 2*x)])
```

Rubi [A] time = 0.296052, antiderivative size = 290, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 8, integrand size = 37, $\frac{\text{number of rules}}{\text{integrand size}} = 0.216$, Rules used = {177, 1599, 1602, 12, 170, 418, 176, 424}

$$\frac{39332\sqrt{2-3x}\sqrt{4x+1}\sqrt{5x+7}}{74828637\sqrt{2x-5}} - \frac{98330\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}}{74828637\sqrt{5x+7}} - \frac{10\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}}{2691(5x+7)^{3/2}} + \frac{716\sqrt{\frac{11}{23}}\sqrt{5x+7}F\left(\tan^{-1}\left(\frac{\sqrt{4x+1}}{\sqrt{2}\sqrt{2-3x}}\right), -\frac{39}{23}\right)}{61893\sqrt{2x-5}}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[2 - 3*x]/(Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(7 + 5*x)^(5/2)), x]
```

```
[Out] (-10*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/(2691*(7 + 5*x)^(3/2)) - (
98330*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/(74828637*Sqrt[7 + 5*x])
+ (39332*Sqrt[2 - 3*x]*Sqrt[1 + 4*x]*Sqrt[7 + 5*x])/(74828637*Sqrt[-5 + 2*x
]) - (19666*Sqrt[11/39]*Sqrt[2 - 3*x]*Sqrt[(7 + 5*x)/(5 - 2*x)]*EllipticE[A
rcSin[(Sqrt[39/23]*Sqrt[1 + 4*x])/Sqrt[-5 + 2*x]], -23/39])/(1918683*Sqrt[(
2 - 3*x)/(5 - 2*x)]*Sqrt[7 + 5*x]) + (716*Sqrt[11/23]*Sqrt[7 + 5*x]*Ellipti
cF[ArcTan[Sqrt[1 + 4*x]/(Sqrt[2]*Sqrt[2 - 3*x])], -39/23])/(61893*Sqrt[-5 +
2*x]*Sqrt[(7 + 5*x)/(5 - 2*x)])
```

Rule 177

```
Int[(((a_.) + (b_.)*(x_))^(m_)*Sqrt[(c_.) + (d_.)*(x_)])/(Sqrt[(e_.) + (f_.)
]*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Simp[(b*(a + b*x)^(m + 1)*S
qrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/((m + 1)*(b*e - a*f)*(b*g - a*h))
, x] + Dist[1/(2*(m + 1)*(b*e - a*f)*(b*g - a*h)), Int[((a + b*x)^(m + 1)/(
Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]))*Simp[2*a*c*f*h*(m + 1) - b*(d*e
*g + c*(2*m + 3)*(f*g + e*h)) + 2*(a*d*f*h*(m + 1) - b*(m + 2)*(d*f*g + d*e
*h + c*f*h))*x - b*d*f*h*(2*m + 5)*x^2, x], x] /; FreeQ[{a, b, c, d, e,
f, g, h, m}, x] && IntegerQ[2*m] && LeQ[m, -2]
```

Rule 1599

```
Int[(((a_.) + (b_.)*(x_))^(m_)*((A_.) + (B_.)*(x_)))/(Sqrt[(c_.) + (d_.)*(x
_)]*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Simp[(
(A*b^2 - a*b*B)*(a + b*x)^(m + 1)*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]
)/((m + 1)*(b*c - a*d)*(b*e - a*f)*(b*g - a*h)), x] - Dist[1/(2*(m + 1)*(b*
c - a*d)*(b*e - a*f)*(b*g - a*h)), Int[((a + b*x)^(m + 1)/(Sqrt[c + d*x]*Sq
rt[e + f*x]*Sqrt[g + h*x]))*Simp[A*(2*a^2*d*f*h*(m + 1) - 2*a*b*(m + 1)*(d*
f*g + d*e*h + c*f*h) + b^2*(2*m + 3)*(d*e*g + c*f*g + c*e*h)) - b*B*(a*(d*e
*g + c*f*g + c*e*h) + 2*b*c*e*g*(m + 1)) - 2*((A*b - a*B)*(a*d*f*h*(m + 1)
- b*(m + 2)*(d*f*g + d*e*h + c*f*h)))*x + d*f*h*(2*m + 5)*(A*b^2 - a*b*B)*x
^2, x], x] /; FreeQ[{a, b, c, d, e, f, g, h, A, B}, x] && IntegerQ[2*m]
&& LtQ[m, -1]
```

Rule 1602

```
Int[((A_.) + (B_.)*(x_) + (C_.)*(x_)^2)/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.
) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbo
l] := Simp[(C*Sqrt[a + b*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(b*f*h*Sqrt[c + d*
x]), x] + (Dist[1/(2*b*d*f*h), Int[(1*Simp[2*A*b*d*f*h - C*(b*d*e*g + a*c*f
*h) + (2*b*B*d*f*h - C*(a*d*f*h + b*(d*f*g + d*e*h + c*f*h)))*x, x])/(Sqrt[
a + b*x]*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]), x], x] + Dist[(C*(d*e
- c*f)*(d*g - c*h))/(2*b*d*f*h), Int[Sqrt[a + b*x]/((c + d*x)^(3/2)*Sqrt[e
+ f*x]*Sqrt[g + h*x]), x], x] /; FreeQ[{a, b, c, d, e, f, g, h, A, B, C},
x]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_)] /; FreeQ[b, x]
```

Rule 170

```
Int[1/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)
```

```

*(x_)]*Sqrt[(g_.) + (h_.)*(x_)])], x_Symbol] := Dist[(2*Sqrt[g + h*x]*Sqrt[(
(b*e - a*f)*(c + d*x))/((d*e - c*f)*(a + b*x))])/((f*g - e*h)*Sqrt[c + d*x]
*Sqrt[-(((b*e - a*f)*(g + h*x))/((f*g - e*h)*(a + b*x))))], Subst[Int[1/(Sqr
rt[1 + ((b*c - a*d)*x^2)/(d*e - c*f)]*Sqrt[1 - ((b*g - a*h)*x^2)/(f*g - e*h
)]), x], x, Sqrt[e + f*x]/Sqrt[a + b*x]], x] /; FreeQ[{a, b, c, d, e, f, g,
h}, x]

```

Rule 418

```

Int[1/(Sqrt[(a_) + (b_.)*(x_)^2]*Sqrt[(c_) + (d_.)*(x_)^2]), x_Symbol] := S
imp[(Sqrt[a + b*x^2]*EllipticF[ArcTan[Rt[d/c, 2]*x], 1 - (b*c)/(a*d)]/(a*R
t[d/c, 2]*Sqrt[c + d*x^2]*Sqrt[(c*(a + b*x^2))/(a*(c + d*x^2))]), x] /; Fre
eQ[{a, b, c, d}, x] && PosQ[d/c] && PosQ[b/a] && !SimplerSqrtQ[b/a, d/c]

```

Rule 176

```

Int[Sqrt[(c_.) + (d_.)*(x_)]/(((a_.) + (b_.)*(x_))^(3/2)*Sqrt[(e_.) + (f_.)
*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Dist[(-2*Sqrt[c + d*x]*Sqrt[
-(((b*e - a*f)*(g + h*x))/((f*g - e*h)*(a + b*x))))]/((b*e - a*f)*Sqrt[g +
h*x]*Sqrt[(b*e - a*f)*(c + d*x))/((d*e - c*f)*(a + b*x))], Subst[Int[Sqrt
[1 + ((b*c - a*d)*x^2)/(d*e - c*f)]/Sqrt[1 - ((b*g - a*h)*x^2)/(f*g - e*h)
], x], x, Sqrt[e + f*x]/Sqrt[a + b*x]], x] /; FreeQ[{a, b, c, d, e, f, g, h}
, x]

```

Rule 424

```

Int[Sqrt[(a_) + (b_.)*(x_)^2]/Sqrt[(c_) + (d_.)*(x_)^2], x_Symbol] := Simp[
(Sqrt[a]*EllipticE[ArcSin[Rt[-(d/c), 2]*x], (b*c)/(a*d)]/(Sqrt[c]*Rt[-(d/c
), 2]), x] /; FreeQ[{a, b, c, d}, x] && NegQ[d/c] && GtQ[c, 0] && GtQ[a, 0]

```

Rubi steps

$$\begin{aligned}
\int \frac{\sqrt{2-3x}}{\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^{5/2}} dx &= -\frac{10\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{2691(7+5x)^{3/2}} - \frac{\int \frac{-771+854x}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^{3/2}} dx}{2691} \\
&= -\frac{10\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{2691(7+5x)^{3/2}} - \frac{98330\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{74828637\sqrt{7+5x}} - \frac{\int \frac{-2381456-1}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^{3/2}} dx}{74828637} \\
&= -\frac{10\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{2691(7+5x)^{3/2}} - \frac{98330\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{74828637\sqrt{7+5x}} + \frac{39332\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{74828637} \\
&= -\frac{10\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{2691(7+5x)^{3/2}} - \frac{98330\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{74828637\sqrt{7+5x}} + \frac{39332\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{74828637} \\
&= -\frac{10\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{2691(7+5x)^{3/2}} - \frac{98330\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{74828637\sqrt{7+5x}} + \frac{39332\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{74828637} \\
&= -\frac{10\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{2691(7+5x)^{3/2}} - \frac{98330\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{74828637\sqrt{7+5x}} + \frac{39332\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{74828637}
\end{aligned}$$

Mathematica [A] time = 1.80488, size = 248, normalized size = 0.86

$$\frac{2\sqrt{2x-5}\sqrt{4x+1} \left(31 \left(92\sqrt{682}(3x-2) \sqrt{\frac{8x^2-18x-5}{(2-3x)^2}} (5x+7)^2 \text{EllipticF} \left(\sin^{-1} \left(\sqrt{\frac{31}{39}} \sqrt{\frac{2x-5}{3x-2}} \right), \frac{39}{62} \right) + \sqrt{\frac{5x+7}{3x-2}} (285680x^3 - \dots) \right) \right)}{74828637\sqrt{2-3x}(5x+7)^{3/2}\sqrt{\frac{5x}{3x-2}}}$$

Antiderivative was successfully verified.

[In] Integrate[Sqrt[2 - 3*x]/(Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(7 + 5*x)^(5/2)), x]

[Out] (-2*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(-9833*Sqrt[682]*(-2 + 3*x)*(7 + 5*x)^2*Sqrt[(-5 - 18*x + 8*x^2)/(2 - 3*x)^2]*EllipticE[ArcSin[Sqrt[31/39]*Sqrt[(-5 + 2*x)/(-2 + 3*x)]], 39/62] + 31*(Sqrt[(7 + 5*x)/(-2 + 3*x)]*(-389005 - 1578 968*x - 20372*x^2 + 285680*x^3) + 92*Sqrt[682]*(-2 + 3*x)*(7 + 5*x)^2*Sqrt[(-5 - 18*x + 8*x^2)/(2 - 3*x)^2]*EllipticF[ArcSin[Sqrt[31/39]*Sqrt[(-5 + 2*x)/(-2 + 3*x)]], 39/62]))/(74828637*Sqrt[2 - 3*x]*(7 + 5*x)^(3/2)*Sqrt[(7

+ 5*x)/(-2 + 3*x)]*(-5 - 18*x + 8*x^2))

Maple [B] time = 0.029, size = 786, normalized size = 2.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] int((2-3*x)^(1/2)/(7+5*x)^(5/2)/(2*x-5)^(1/2)/(4*x+1)^(1/2), x)

[Out] 2/74828637*(101200*11^(1/2)*((7+5*x)/(4*x+1))^(1/2)*3^(1/2)*13^(1/2)*((2*x-5)/(4*x+1))^(1/2)*((-2+3*x)/(4*x+1))^(1/2)*EllipticF(1/31*31^(1/2)*11^(1/2)*((7+5*x)/(4*x+1))^(1/2), 1/39*31^(1/2)*78^(1/2))*x^3+786640*11^(1/2)*((7+5*x)/(4*x+1))^(1/2)*3^(1/2)*13^(1/2)*((2*x-5)/(4*x+1))^(1/2)*((-2+3*x)/(4*x+1))^(1/2)*EllipticE(1/31*31^(1/2)*11^(1/2)*((7+5*x)/(4*x+1))^(1/2), 1/39*31^(1/2)*78^(1/2))*x^3+192280*11^(1/2)*((7+5*x)/(4*x+1))^(1/2)*3^(1/2)*13^(1/2)*((2*x-5)/(4*x+1))^(1/2)*((-2+3*x)/(4*x+1))^(1/2)*x^2*EllipticF(1/31*31^(1/2)*11^(1/2)*((7+5*x)/(4*x+1))^(1/2), 1/39*31^(1/2)*78^(1/2))+1494616*11^(1/2)*((7+5*x)/(4*x+1))^(1/2)*3^(1/2)*13^(1/2)*((2*x-5)/(4*x+1))^(1/2)*((-2+3*x)/(4*x+1))^(1/2)*x^2*EllipticE(1/31*31^(1/2)*11^(1/2)*((7+5*x)/(4*x+1))^(1/2), 1/39*31^(1/2)*78^(1/2))+77165*11^(1/2)*((7+5*x)/(4*x+1))^(1/2)*3^(1/2)*13^(1/2)*((2*x-5)/(4*x+1))^(1/2)*((-2+3*x)/(4*x+1))^(1/2)*x*EllipticF(1/31*31^(1/2)*11^(1/2)*((7+5*x)/(4*x+1))^(1/2), 1/39*31^(1/2)*78^(1/2))+599813*11^(1/2)*((7+5*x)/(4*x+1))^(1/2)*3^(1/2)*13^(1/2)*((2*x-5)/(4*x+1))^(1/2)*((-2+3*x)/(4*x+1))^(1/2)*x*EllipticE(1/31*31^(1/2)*11^(1/2)*((7+5*x)/(4*x+1))^(1/2), 1/39*31^(1/2)*78^(1/2))+8855*11^(1/2)*((7+5*x)/(4*x+1))^(1/2)*3^(1/2)*13^(1/2)*((2*x-5)/(4*x+1))^(1/2)*((-2+3*x)/(4*x+1))^(1/2)*EllipticF(1/31*31^(1/2)*11^(1/2)*((7+5*x)/(4*x+1))^(1/2), 1/39*31^(1/2)*78^(1/2))+68831*11^(1/2)*((7+5*x)/(4*x+1))^(1/2)*3^(1/2)*13^(1/2)*((2*x-5)/(4*x+1))^(1/2)*((-2+3*x)/(4*x+1))^(1/2)*EllipticE(1/31*31^(1/2)*11^(1/2)*((7+5*x)/(4*x+1))^(1/2), 1/39*31^(1/2)*78^(1/2))+3447930*x^3-2253977*x^2-21690932*x+14440780)*(4*x+1)^(1/2)*(2*x-5)^(1/2)*(2-3*x)^(1/2)/(120*x^4-182*x^3-385*x^2+197*x+70)/(7+5*x)^(1/2)

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{-3x+2}}{(5x+7)^2 \sqrt{4x+1} \sqrt{2x-5}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2-3*x)^(1/2)/(7+5*x)^(5/2)/(-5+2*x)^(1/2)/(1+4*x)^(1/2),x, algorithm="maxima")

[Out] integrate(sqrt(-3*x + 2)/((5*x + 7)^(5/2)*sqrt(4*x + 1)*sqrt(2*x - 5)), x)

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{5x+7}\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2}}{1000x^5+1950x^4-4195x^3-13111x^2-9849x-1715}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2-3*x)^(1/2)/(7+5*x)^(5/2)/(-5+2*x)^(1/2)/(1+4*x)^(1/2),x, algorithm="fricas")

[Out] integral(sqrt(5*x + 7)*sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)/(1000*x^5 + 1950*x^4 - 4195*x^3 - 13111*x^2 - 9849*x - 1715), x)

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2-3*x)**(1/2)/(7+5*x)**(5/2)/(-5+2*x)**(1/2)/(1+4*x)**(1/2),x)

[Out] Timed out

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{-3x+2}}{(5x+7)^{\frac{5}{2}}\sqrt{4x+1}\sqrt{2x-5}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2-3*x)^(1/2)/(7+5*x)^(5/2)/(-5+2*x)^(1/2)/(1+4*x)^(1/2),x, algorithm="giac")

```
[Out] integrate(sqrt(-3*x + 2)/((5*x + 7)^(5/2)*sqrt(4*x + 1)*sqrt(2*x - 5)), x)
```

$$3.99 \quad \int \frac{\sqrt{a+bx}\sqrt{c+dx}}{\sqrt{e+fx}\sqrt{g+hx}} dx$$

Optimal. Leaf size=721

$$\frac{\sqrt{g+hx}(de-cf)(-2afh+beh+bfh)\sqrt{\frac{(c+dx)(be-af)}{(a+bx)(de-cf)}} \operatorname{EllipticF}\left(\sin^{-1}\left(\frac{\sqrt{e+fx}\sqrt{bg-ah}}{\sqrt{a+bx}\sqrt{fg-eh}}\right), -\frac{(bc-ad)(fg-eh)}{(bg-ah)(de-cf)}\right) + (e+fx)\sqrt{bg-ah}}{f^2h\sqrt{c+dx}\sqrt{bg-ah}\sqrt{fg-eh}\sqrt{-\frac{(g+hx)(be-af)}{(a+bx)(fg-eh)}}}$$

[Out] (Sqrt[a + b*x]*Sqrt[c + d*x]*Sqrt[g + h*x])/(h*Sqrt[e + f*x]) - (Sqrt[d*g - c*h]*Sqrt[f*g - e*h]*Sqrt[a + b*x]*Sqrt[((d*e - c*f)*(g + h*x))/((d*g - c*h)*(e + f*x))])*EllipticE[ArcSin[(Sqrt[f*g - e*h]*Sqrt[c + d*x])/(Sqrt[d*g - c*h]*Sqrt[e + f*x])], ((b*e - a*f)*(d*g - c*h))/((b*c - a*d)*(f*g - e*h))]/(f*h*Sqrt[-(((d*e - c*f)*(a + b*x))/((b*c - a*d)*(e + f*x)))]*Sqrt[g + h*x]) + ((d*e - c*f)*(b*f*g + b*e*h - 2*a*f*h)*Sqrt[((b*e - a*f)*(c + d*x))/((d*e - c*f)*(a + b*x))])*Sqrt[g + h*x]*EllipticF[ArcSin[(Sqrt[b*g - a*h]*Sqrt[e + f*x])/(Sqrt[f*g - e*h]*Sqrt[a + b*x])], -(((b*c - a*d)*(f*g - e*h))/((d*e - c*f)*(b*g - a*h)))]/(f^2*h*Sqrt[b*g - a*h]*Sqrt[f*g - e*h]*Sqrt[c + d*x]*Sqrt[-(((b*e - a*f)*(g + h*x))/((f*g - e*h)*(a + b*x)))]]) + (Sqrt[b*g - a*h]*(a*d*f*h - b*(d*f*g + d*e*h - c*f*h))*Sqrt[((f*g - e*h)*(a + b*x))/((b*g - a*h)*(e + f*x))])*Sqrt[((f*g - e*h)*(c + d*x))/((d*g - c*h)*(e + f*x)))]*(e + f*x)*EllipticPi[(f*(b*g - a*h))/((b*e - a*f)*h), ArcSin[(Sqrt[b*e - a*f]*Sqrt[g + h*x])/(Sqrt[b*g - a*h]*Sqrt[e + f*x])], ((d*e - c*f)*(b*g - a*h))/((b*e - a*f)*(d*g - c*h)))]/(f^2*Sqrt[b*e - a*f]*h^2*Sqrt[a + b*x]*Sqrt[c + d*x])

Rubi [A] time = 0.674845, antiderivative size = 721, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 37, $\frac{\text{number of rules}}{\text{integrand size}} = 0.189$, Rules used = {173, 176, 424, 170, 419, 165, 537}

$$\frac{(e+fx)\sqrt{bg-ah}\sqrt{\frac{(a+bx)(fg-eh)}{(e+fx)(bg-ah)}}\sqrt{\frac{(c+dx)(fg-eh)}{(e+fx)(dg-ch)}}(afh-b(-cfh+deh+dfg))\Pi\left(\frac{f(bg-ah)}{(be-af)h}, \sin^{-1}\left(\frac{\sqrt{be-af}\sqrt{g+hx}}{\sqrt{bg-ah}\sqrt{e+fx}}\right), \frac{(de-cf)(bg-ah)}{(be-af)(dg-ch)}\right)}{f^2h^2\sqrt{a+bx}\sqrt{c+dx}\sqrt{be-af}}$$

Antiderivative was successfully verified.

[In] Int[(Sqrt[a + b*x]*Sqrt[c + d*x])/(Sqrt[e + f*x]*Sqrt[g + h*x]), x]

[Out] (Sqrt[a + b*x]*Sqrt[c + d*x]*Sqrt[g + h*x])/(h*Sqrt[e + f*x]) - (Sqrt[d*g - c*h]*Sqrt[f*g - e*h]*Sqrt[a + b*x]*Sqrt[((d*e - c*f)*(g + h*x))/((d*g - c*h)*(e + f*x))])*EllipticE[ArcSin[(Sqrt[f*g - e*h]*Sqrt[c + d*x])/(Sqrt[d*g - c*h]*Sqrt[e + f*x])], ((b*e - a*f)*(d*g - c*h))/((b*c - a*d)*(f*g - e*h))]/(f*h*Sqrt[-(((d*e - c*f)*(a + b*x))/((b*c - a*d)*(e + f*x)))]*Sqrt[g + h*x]) + ((d*e - c*f)*(b*f*g + b*e*h - 2*a*f*h)*Sqrt[((b*e - a*f)*(c + d*x))/((d*e - c*f)*(a + b*x))])*Sqrt[g + h*x]*EllipticF[ArcSin[(Sqrt[b*g - a*h]*Sqrt[e + f*x])/(Sqrt[f*g - e*h]*Sqrt[a + b*x])], -(((b*c - a*d)*(f*g - e*h))/((d*e - c*f)*(b*g - a*h)))]/(f^2*h*Sqrt[b*g - a*h]*Sqrt[f*g - e*h]*Sqrt[c + d*x]*Sqrt[-(((b*e - a*f)*(g + h*x))/((f*g - e*h)*(a + b*x)))]]) + (Sqrt[b*g - a*h]*(a*d*f*h - b*(d*f*g + d*e*h - c*f*h))*Sqrt[((f*g - e*h)*(a + b*x))/((b*g - a*h)*(e + f*x))])*Sqrt[((f*g - e*h)*(c + d*x))/((d*g - c*h)*(e + f*x)))]*(e + f*x)*EllipticPi[(f*(b*g - a*h))/((b*e - a*f)*h), ArcSin[(Sqrt[b*e - a*f]*Sqrt[g + h*x])/(Sqrt[b*g - a*h]*Sqrt[e + f*x])], ((d*e - c*f)*(b*g - a*h))/((b*e - a*f)*(d*g - c*h)))]/(f^2*Sqrt[b*e - a*f]*h^2*Sqrt[a + b*x]*Sqrt[c + d*x])

```

h)*(e + f*x)]*EllipticE[ArcSin[(Sqrt[f*g - e*h]*Sqrt[c + d*x])/(Sqrt[d*g -
c*h]*Sqrt[e + f*x])], ((b*e - a*f)*(d*g - c*h))/((b*c - a*d)*(f*g - e*h))]
)/(f*h*Sqrt[-(((d*e - c*f)*(a + b*x))/((b*c - a*d)*(e + f*x)))]*Sqrt[g + h*
x]) + ((d*e - c*f)*(b*f*g + b*e*h - 2*a*f*h)*Sqrt[((b*e - a*f)*(c + d*x))/(
(d*e - c*f)*(a + b*x))]*Sqrt[g + h*x]*EllipticF[ArcSin[(Sqrt[b*g - a*h]*Sqr
t[e + f*x])/(Sqrt[f*g - e*h]*Sqrt[a + b*x])], -(((b*c - a*d)*(f*g - e*h))/(
(d*e - c*f)*(b*g - a*h)))]/(f^2*h*Sqrt[b*g - a*h]*Sqrt[f*g - e*h]*Sqrt[c +
d*x]*Sqrt[-(((b*e - a*f)*(g + h*x))/((f*g - e*h)*(a + b*x)))] + (Sqrt[b*g
- a*h]*(a*d*f*h - b*(d*f*g + d*e*h - c*f*h))*Sqrt[((f*g - e*h)*(a + b*x))/
((b*g - a*h)*(e + f*x))]*Sqrt[((f*g - e*h)*(c + d*x))/((d*g - c*h)*(e + f*x
))]*(e + f*x)*EllipticPi[(f*(b*g - a*h))/((b*e - a*f)*h), ArcSin[(Sqrt[b*e
- a*f]*Sqrt[g + h*x])/(Sqrt[b*g - a*h]*Sqrt[e + f*x])], ((d*e - c*f)*(b*g -
a*h))/((b*e - a*f)*(d*g - c*h)))]/(f^2*Sqrt[b*e - a*f]*h^2*Sqrt[a + b*x]*S
qrt[c + d*x])

```

Rule 173

```

Int[(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)])/(Sqrt[(e_.) + (f_.)
*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Simp[(Sqrt[a + b*x]*Sqrt[c +
d*x]*Sqrt[g + h*x])/(h*Sqrt[e + f*x]), x] + (-Dist[((d*e - c*f)*(f*g - e*h
))/(2*f*h), Int[Sqrt[a + b*x]/(Sqrt[c + d*x]*(e + f*x)^(3/2)*Sqrt[g + h*x])
, x], x] + Dist[((d*e - c*f)*(b*f*g + b*e*h - 2*a*f*h))/(2*f^2*h), Int[1/(S
qrt[a + b*x]*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]), x], x] + Dist[(a*d
*f*h - b*(d*f*g + d*e*h - c*f*h))/(2*f^2*h), Int[Sqrt[e + f*x]/(Sqrt[a + b*
x]*Sqrt[c + d*x]*Sqrt[g + h*x]), x], x]) /; FreeQ[{a, b, c, d, e, f, g, h},
x]

```

Rule 176

```

Int[Sqrt[(c_.) + (d_.)*(x_)]/(((a_.) + (b_.)*(x_))^(3/2)*Sqrt[(e_.) + (f_.)
*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Dist[(-2*Sqrt[c + d*x]*Sqrt[
-(((b*e - a*f)*(g + h*x))/((f*g - e*h)*(a + b*x)))]/((b*e - a*f)*Sqrt[g +
h*x]*Sqrt[((b*e - a*f)*(c + d*x))/((d*e - c*f)*(a + b*x))]), Subst[Int[Sqrt
[1 + ((b*c - a*d)*x^2)/(d*e - c*f)]/Sqrt[1 - ((b*g - a*h)*x^2)/(f*g - e*h)]
, x], x, Sqrt[e + f*x]/Sqrt[a + b*x]], x] /; FreeQ[{a, b, c, d, e, f, g, h},
x]

```

Rule 424

```

Int[Sqrt[(a_) + (b_.)*(x_)^2]/Sqrt[(c_) + (d_.)*(x_)^2], x_Symbol] := Simp[
(Sqrt[a]*EllipticE[ArcSin[Rt[-(d/c), 2]*x], (b*c)/(a*d)]/(Sqrt[c]*Rt[-(d/c
), 2]), x] /; FreeQ[{a, b, c, d}, x] && NegQ[d/c] && GtQ[c, 0] && GtQ[a, 0]

```

Rule 170

```
Int[1/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)
*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Dist[(2*Sqrt[g + h*x]*Sqrt[(
(b*e - a*f)*(c + d*x))/((d*e - c*f)*(a + b*x))])/((f*g - e*h)*Sqrt[c + d*x]
*Sqrt[-((b*e - a*f)*(g + h*x))/((f*g - e*h)*(a + b*x))]), Subst[Int[1/(Sq
rt[1 + ((b*c - a*d)*x^2)/(d*e - c*f)]*Sqrt[1 - ((b*g - a*h)*x^2)/(f*g - e*h
)]), x], x, Sqrt[e + f*x]/Sqrt[a + b*x]], x] /; FreeQ[{a, b, c, d, e, f, g,
h}, x]
```

Rule 419

```
Int[1/(Sqrt[(a_) + (b_.)*(x_)^2]*Sqrt[(c_) + (d_.)*(x_)^2]), x_Symbol] := S
imp[(1*EllipticF[ArcSin[Rt[-(d/c), 2]*x], (b*c)/(a*d)]/(Sqrt[a]*Sqrt[c]*Rt
[-(d/c), 2]), x] /; FreeQ[{a, b, c, d}, x] && NegQ[d/c] && GtQ[c, 0] && GtQ
[a, 0] && !(NegQ[b/a] && SimplerSqrtQ[-(b/a), -(d/c)])
```

Rule 165

```
Int[Sqrt[(a_.) + (b_.)*(x_)]/(Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(
x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Dist[(2*(a + b*x)*Sqrt[((b*g -
a*h)*(c + d*x))/((d*g - c*h)*(a + b*x))]*Sqrt[((b*g - a*h)*(e + f*x))/((f*
g - e*h)*(a + b*x))])/((Sqrt[c + d*x]*Sqrt[e + f*x]), Subst[Int[1/((h - b*x^
2)*Sqrt[1 + ((b*c - a*d)*x^2)/(d*g - c*h)]*Sqrt[1 + ((b*e - a*f)*x^2)/(f*g
- e*h)]), x], x, Sqrt[g + h*x]/Sqrt[a + b*x]], x] /; FreeQ[{a, b, c, d, e,
f, g, h}, x]
```

Rule 537

```
Int[1/(((a_) + (b_.)*(x_)^2)*Sqrt[(c_) + (d_.)*(x_)^2]*Sqrt[(e_) + (f_.)*(x
_)^2]), x_Symbol] := Simp[(1*EllipticPi[(b*c)/(a*d), ArcSin[Rt[-(d/c), 2]*x
], (c*f)/(d*e)]/(a*Sqrt[c]*Sqrt[e]*Rt[-(d/c), 2]), x] /; FreeQ[{a, b, c, d
, e, f}, x] && !GtQ[d/c, 0] && GtQ[c, 0] && GtQ[e, 0] && !( !GtQ[f/e, 0]
&& SimplerSqrtQ[-(f/e), -(d/c)])
```

Rubi steps

$$\begin{aligned}
\int \frac{\sqrt{a+bx}\sqrt{c+dx}}{\sqrt{e+fx}\sqrt{g+hx}} dx &= \frac{\sqrt{a+bx}\sqrt{c+dx}\sqrt{g+hx}}{h\sqrt{e+fx}} - \frac{((de-cf)(fg-eh)) \int \frac{\sqrt{a+bx}}{\sqrt{c+dx}(e+fx)^{3/2}\sqrt{g+hx}} dx}{2fh} + \frac{((de-cf)(bfg+beh))}{2fh} \\
&= \frac{\sqrt{a+bx}\sqrt{c+dx}\sqrt{g+hx}}{h\sqrt{e+fx}} + \frac{\left((adf h - b(dfg + deh - cfh)) \sqrt{\frac{(fg-eh)(a+bx)}{(bg-ah)(e+fx)}} \sqrt{\frac{(fg-eh)(c+dx)}{(dg-ch)(e+fx)}} (e+fx) \right)}{f^2 h \sqrt{a+bx}\sqrt{c+dx}} \\
&= \frac{\sqrt{a+bx}\sqrt{c+dx}\sqrt{g+hx}}{h\sqrt{e+fx}} - \frac{\sqrt{dg-ch}\sqrt{fg-eh}\sqrt{a+bx} \sqrt{\frac{(de-cf)(g+hx)}{(dg-ch)(e+fx)}} E \left(\sin^{-1} \left(\frac{\sqrt{fg-eh}\sqrt{c+dx}}{\sqrt{dg-ch}\sqrt{e+fx}} \right) \right)}{fh \sqrt{-\frac{(de-cf)(a+bx)}{(bc-ad)(e+fx)}} \sqrt{g+hx}}
\end{aligned}$$

Mathematica [B] time = 15.1257, size = 6667, normalized size = 9.25

Result too large to show

Warning: Unable to verify antiderivative.

[In] Integrate[(Sqrt[a + b*x]*Sqrt[c + d*x])/(Sqrt[e + f*x]*Sqrt[g + h*x]),x]

[Out] Result too large to show

Maple [B] time = 0.151, size = 18077, normalized size = 25.1

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b*x+a)^(1/2)*(d*x+c)^(1/2)/(f*x+e)^(1/2)/(h*x+g)^(1/2),x)

[Out] result too large to display

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{bx+a}\sqrt{dx+c}}{\sqrt{fx+e}\sqrt{hx+g}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^(1/2)*(d*x+c)^(1/2)/(f*x+e)^(1/2)/(h*x+g)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(sqrt(b*x + a)*sqrt(d*x + c)/(sqrt(f*x + e)*sqrt(h*x + g)), x)
```

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^(1/2)*(d*x+c)^(1/2)/(f*x+e)^(1/2)/(h*x+g)^(1/2),x, algorithm="fricas")
```

```
[Out] Timed out
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{a+bx}\sqrt{c+dx}}{\sqrt{e+fx}\sqrt{g+hx}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)**(1/2)*(d*x+c)**(1/2)/(f*x+e)**(1/2)/(h*x+g)**(1/2),x)
```

```
[Out] Integral(sqrt(a + b*x)*sqrt(c + d*x)/(sqrt(e + f*x)*sqrt(g + h*x)), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{bx+a}\sqrt{dx+c}}{\sqrt{fx+e}\sqrt{hx+g}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^(1/2)*(d*x+c)^(1/2)/(f*x+e)^(1/2)/(h*x+g)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(sqrt(b*x + a)*sqrt(d*x + c)/(sqrt(f*x + e)*sqrt(h*x + g)), x)
```


$$3.100 \quad \int \frac{\sqrt{c+dx}}{(a+bx)^{3/2}\sqrt{e+fx}\sqrt{g+hx}} dx$$

Optimal. Leaf size=161

$$\frac{2\sqrt{c+dx}E\left(\tan^{-1}\left(\frac{\sqrt{af-be}\sqrt{g+hx}}{\sqrt{bg-ah}\sqrt{e+fx}}\right)\middle| \frac{(ad-bc)(fg-eh)}{(af-be)(dg-ch)}\right)}{\sqrt{a+bx}\sqrt{af-be}\sqrt{bg-ah}\sqrt{\frac{(c+dx)(bg-ah)}{(a+bx)(dg-ch)}}}$$

[Out] $(-2*\text{Sqrt}[c + d*x]*\text{EllipticE}[\text{ArcTan}[(\text{Sqrt}[-(b*e) + a*f]*\text{Sqrt}[g + h*x])]/(\text{Sqrt}[b*g - a*h]*\text{Sqrt}[e + f*x])], ((-(b*c) + a*d)*(f*g - e*h))/((-(b*e) + a*f)*(d*g - c*h)))]/(\text{Sqrt}[-(b*e) + a*f]*\text{Sqrt}[b*g - a*h]*\text{Sqrt}[a + b*x]*\text{Sqrt}[(b*g - a*h)*(c + d*x)/((d*g - c*h)*(a + b*x))])$

Rubi [A] time = 0.0925571, antiderivative size = 208, normalized size of antiderivative = 1.29, number of steps used = 2, number of rules used = 2, integrand size = 37, $\frac{\text{number of rules}}{\text{integrand size}} = 0.054$, Rules used = {176, 424}

$$\frac{2\sqrt{c+dx}\sqrt{fg-eh}\sqrt{-\frac{(g+hx)(be-af)}{(a+bx)(fg-eh)}}E\left(\sin^{-1}\left(\frac{\sqrt{bg-ah}\sqrt{e+fx}}{\sqrt{fg-eh}\sqrt{a+bx}}\right)\middle| -\frac{(bc-ad)(fg-eh)}{(de-cf)(bg-ah)}\right)}{\sqrt{g+hx}(be-af)\sqrt{bg-ah}\sqrt{\frac{(c+dx)(be-af)}{(a+bx)(de-cf)}}}$$

Antiderivative was successfully verified.

[In] $\text{Int}[\text{Sqrt}[c + d*x]/((a + b*x)^{(3/2})*\text{Sqrt}[e + f*x]*\text{Sqrt}[g + h*x]), x]$

[Out] $(-2*\text{Sqrt}[f*g - e*h]*\text{Sqrt}[c + d*x]*\text{Sqrt}[-(((b*e - a*f)*(g + h*x))/((f*g - e*h)*(a + b*x)))]*\text{EllipticE}[\text{ArcSin}[(\text{Sqrt}[b*g - a*h]*\text{Sqrt}[e + f*x])/(\text{Sqrt}[f*g - e*h]*\text{Sqrt}[a + b*x])], -(((b*c - a*d)*(f*g - e*h))/((d*e - c*f)*(b*g - a*h)))]/((b*e - a*f)*\text{Sqrt}[b*g - a*h]*\text{Sqrt}[(b*e - a*f)*(c + d*x)/((d*e - c*f)*(a + b*x))])* \text{Sqrt}[g + h*x])$

Rule 176

$\text{Int}[\text{Sqrt}[(c_.) + (d_.)*(x_.)]/(((a_.) + (b_.)*(x_.))^{(3/2})*\text{Sqrt}[(e_.) + (f_.)*(x_.)]*\text{Sqrt}[(g_.) + (h_.)*(x_.)]), x_Symbol] \rightarrow \text{Dist}[(-2*\text{Sqrt}[c + d*x]*\text{Sqrt}[-(((b*e - a*f)*(g + h*x))/((f*g - e*h)*(a + b*x)))]/((b*e - a*f)*\text{Sqrt}[g + h*x]*\text{Sqrt}[(b*e - a*f)*(c + d*x)/((d*e - c*f)*(a + b*x))]), \text{Subst}[\text{Int}[\text{Sqrt}[1 + ((b*c - a*d)*x^2)/(d*e - c*f)]/\text{Sqrt}[1 - ((b*g - a*h)*x^2)/(f*g - e*h)]]$

, x], x, Sqrt[e + f*x]/Sqrt[a + b*x]], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x]

Rule 424

Int[Sqrt[(a_) + (b_.)*(x_)^2]/Sqrt[(c_) + (d_.)*(x_)^2], x_Symbol] :> Simp[(Sqrt[a]*EllipticE[ArcSin[Rt[-(d/c), 2]*x], (b*c)/(a*d)])/(Sqrt[c]*Rt[-(d/c), 2]), x] /; FreeQ[{a, b, c, d}, x] && NegQ[d/c] && GtQ[c, 0] && GtQ[a, 0]

Rubi steps

$$\int \frac{\sqrt{c+dx}}{(a+bx)^{3/2}\sqrt{e+fx}\sqrt{g+hx}} dx = -\frac{\left(2\sqrt{c+dx}\sqrt{-\frac{(be-af)(g+hx)}{(fg-eh)(a+bx)}}\right) \text{Subst}\left(\int \frac{\sqrt{1+\frac{(bc-ad)x^2}{de-cf}}}{\sqrt{1-\frac{(bg-ah)x^2}{fg-eh}}} dx, x, \frac{\sqrt{e+fx}}{\sqrt{a+bx}}\right)}{(be-af)\sqrt{\frac{(be-af)(c+dx)}{(de-cf)(a+bx)}}\sqrt{g+hx}}$$

$$= -\frac{2\sqrt{fg-eh}\sqrt{c+dx}\sqrt{-\frac{(be-af)(g+hx)}{(fg-eh)(a+bx)}} E\left(\sin^{-1}\left(\frac{\sqrt{bg-ah}\sqrt{e+fx}}{\sqrt{fg-eh}\sqrt{a+bx}}\right)\right) - \frac{(bc-ad)(fg-eh)}{(de-cf)(bg-ah)}}{(be-af)\sqrt{bg-ah}\sqrt{\frac{(be-af)(c+dx)}{(de-cf)(a+bx)}}\sqrt{g+hx}}$$

Mathematica [A] time = 4.70662, size = 206, normalized size = 1.28

$$\frac{2\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx} E\left(\sin^{-1}\left(\sqrt{\frac{(af-be)(g+hx)}{(fg-eh)(a+bx)}}\right)\right) - \frac{(bc-ad)(fg-eh)}{(be-af)(dg-ch)}}{(a+bx)^{3/2}(eh-fg)\sqrt{\frac{(c+dx)(bg-ah)}{(a+bx)(dg-ch)}}\sqrt{-\frac{(e+fx)(g+hx)(be-af)(bg-ah)}{(a+bx)^2(fg-eh)^2}}}$$

Antiderivative was successfully verified.

[In] Integrate[Sqrt[c + d*x]/((a + b*x)^(3/2)*Sqrt[e + f*x]*Sqrt[g + h*x]), x]

[Out] (2*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]*EllipticE[ArcSin[Sqrt[((-b*e) + a*f)*(g + h*x)]/((f*g - e*h)*(a + b*x))]], ((b*c - a*d)*(f*g - e*h))/((b*e - a*f)*(d*g - c*h)))/((-f*g) + e*h)*(a + b*x)^(3/2)*Sqrt[((b*g - a*h)*(c + d*x))/((d*g - c*h)*(a + b*x))]*Sqrt[-(((b*e - a*f)*(b*g - a*h)*(e + f*x)*(g + h*x))/((f*g - e*h)^2*(a + b*x)^2))]]

Maple [B] time = 0.118, size = 4590, normalized size = 28.5

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] $\int ((d*x+c)^{(1/2)}/(b*x+a)^{(3/2)}/(f*x+e)^{(1/2)}/(h*x+g)^{(1/2)}, x)$

[Out] $2*(x^2*a*d*e*f*h^2-x^2*a*d*f^2*g*h+x*a*c*e*f*h^2-x^2*b*d*e^2*h^2-b*c*e^2*g*h+b*c*e*f*g^2-x*a*d*f^2*g^2-x*b*c*e^2*h^2-x*a*c*f^2*g*h+EllipticF(((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^{(1/2)}, ((c*f-d*e)*(a*h-b*g)/(c*h-d*g)/(a*f-b*e))^{(1/2)})*a*c*e^2*h^2*((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^{(1/2)}*((e*h-f*g)*(d*x+c)/(c*h-d*g)/(f*x+e))^{(1/2)}*((e*h-f*g)*(b*x+a)/(a*h-b*g)/(f*x+e))^{(1/2)}+EllipticF(((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^{(1/2)}, ((c*f-d*e)*(a*h-b*g)/(c*h-d*g)/(a*f-b*e))^{(1/2)})*x^2*a*c*f^2*h^2*((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^{(1/2)}*((e*h-f*g)*(d*x+c)/(c*h-d*g)/(f*x+e))^{(1/2)}*((e*h-f*g)*(b*x+a)/(a*h-b*g)/(f*x+e))^{(1/2)}+EllipticF(((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^{(1/2)}, ((c*f-d*e)*(a*h-b*g)/(c*h-d*g)/(a*f-b*e))^{(1/2)})*x^2*b*d*f^2*g^2*((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^{(1/2)}*((e*h-f*g)*(d*x+c)/(c*h-d*g)/(f*x+e))^{(1/2)}*((e*h-f*g)*(b*x+a)/(a*h-b*g)/(f*x+e))^{(1/2)}-EllipticE(((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^{(1/2)}, ((c*f-d*e)*(a*h-b*g)/(c*h-d*g)/(a*f-b*e))^{(1/2)})*x^2*a*c*f^2*h^2*((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^{(1/2)}*((e*h-f*g)*(d*x+c)/(c*h-d*g)/(f*x+e))^{(1/2)}*((e*h-f*g)*(b*x+a)/(a*h-b*g)/(f*x+e))^{(1/2)}-EllipticE(((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^{(1/2)}, ((c*f-d*e)*(a*h-b*g)/(c*h-d*g)/(a*f-b*e))^{(1/2)})*x^2*b*d*f^2*g^2*((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^{(1/2)}*((e*h-f*g)*(d*x+c)/(c*h-d*g)/(f*x+e))^{(1/2)}*((e*h-f*g)*(b*x+a)/(a*h-b*g)/(f*x+e))^{(1/2)}-EllipticF(((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^{(1/2)}, ((c*f-d*e)*(a*h-b*g)/(c*h-d*g)/(a*f-b*e))^{(1/2)})*a*d*e^2*g*h*((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^{(1/2)}*((e*h-f*g)*(d*x+c)/(c*h-d*g)/(f*x+e))^{(1/2)}*((e*h-f*g)*(b*x+a)/(a*h-b*g)/(f*x+e))^{(1/2)}-EllipticF(((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^{(1/2)}, ((c*f-d*e)*(a*h-b*g)/(c*h-d*g)/(a*f-b*e))^{(1/2)})*b*c*e^2*g*h*((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^{(1/2)}*((e*h-f*g)*(d*x+c)/(c*h-d*g)/(f*x+e))^{(1/2)}*((e*h-f*g)*(b*x+a)/(a*h-b*g)/(f*x+e))^{(1/2)}+EllipticE(((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^{(1/2)}, ((c*f-d*e)*(a*h-b*g)/(c*h-d*g)/(a*f-b*e))^{(1/2)})*a*d*e^2*g*h*((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^{(1/2)}*((e*h-f*g)*(d*x+c)/(c*h-d*g)/(f*x+e))^{(1/2)}*((e*h-f*g)*(b*x+a)/(a*h-b*g)/(f*x+e))^{(1/2)}+EllipticE(((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^{(1/2)}, ((c*f-d*e)*(a*h-b*g)/(c*h-d*g)/(a*f-b*e))^{(1/2)})*b*c*e^2*g*h*((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^{(1/2)}*((e*h-f*g)*(d*x+c)/(c*h-d*g)/(f*x+e))^{(1/2)}*((e*h-f*g)*(b*x+a)/(a*h-b*g)/(f*x+e))^{(1/2)}+a*c*e*f*g*h+x^2*b*d*e*f*g*h+x*a*d*e*f*g*h+x*b*c*e*f*g*h-a*c*f^2*g^2-2*EllipticE(((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^{(1/2)}, ((c*f-d*e)*(a*h-b*g)/(c*h-d*g)/(a*f-b*e))^{(1/2)})*x*b*d*e*f*g^2*((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^{(1/2)}*((e*h-f*g)*(d*x+c)/(c*h-d*g)/(f*x+e))^{(1/2)}*((e*h-f*g)*(b*x+a)/(a*h-b*g)/(f*x+e))^{(1/2)}-EllipticF(($

$$b*d*e^2*g^2*((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^{(1/2)}*((e*h-f*g)*(d*x+c)/(c*h-d*g)/(f*x+e))^{(1/2)}*((e*h-f*g)*(b*x+a)/(a*h-b*g)/(f*x+e))^{(1/2)}/(h*x+g)^{(1/2)}/(f*x+e)^{(1/2)}/(b*x+a)^{(1/2)}/(d*x+c)^{(1/2)}/(a*h-b*g)/(e*h-f*g)/(a*f-b*e)$$

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{dx+c}}{(bx+a)^2 \sqrt{fx+e} \sqrt{hx+g}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d*x+c)^(1/2)/(b*x+a)^(3/2)/(f*x+e)^(1/2)/(h*x+g)^(1/2),x, algorithm="maxima")

[Out] integrate(sqrt(d*x + c)/((b*x + a)^(3/2)*sqrt(f*x + e)*sqrt(h*x + g)), x)

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{bx+a}\sqrt{dx+c}\sqrt{fx+e}\sqrt{hx+g}}{b^2fhx^4 + a^2eg + (b^2fg + (b^2e + 2abf)h)x^3 + ((b^2e + 2abf)g + (2abe + a^2f)h)x^2 + (a^2eh + (2abe + a^2f)g)}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d*x+c)^(1/2)/(b*x+a)^(3/2)/(f*x+e)^(1/2)/(h*x+g)^(1/2),x, algorithm="fricas")

[Out] integral(sqrt(b*x + a)*sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)/(b^2*f*h*x^4 + a^2*e*g + (b^2*f*g + (b^2*e + 2*a*b*f)*h)*x^3 + ((b^2*e + 2*a*b*f)*g + (2*a*b*e + a^2*f)*h)*x^2 + (a^2*e*h + (2*a*b*e + a^2*f)*g)*x), x)

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*x+c)**(1/2)/(b*x+a)**(3/2)/(f*x+e)**(1/2)/(h*x+g)**(1/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{dx+c}}{(bx+a)^{\frac{3}{2}} \sqrt{fx+e} \sqrt{hx+g}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*x+c)^(1/2)/(b*x+a)^(3/2)/(f*x+e)^(1/2)/(h*x+g)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(sqrt(d*x + c)/((b*x + a)^(3/2)*sqrt(f*x + e)*sqrt(h*x + g)), x)
```

$$3.101 \quad \int \frac{(7+5x)^{5/2}}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}} dx$$

Optimal. Leaf size=351

$$\frac{29047\sqrt{\frac{23}{11}}\sqrt{5x+7}\text{EllipticF}\left(\tan^{-1}\left(\frac{\sqrt{4x+1}}{\sqrt{2}\sqrt{2-3x}}\right), -\frac{39}{23}\right)}{576\sqrt{2x-5}\sqrt{\frac{5x+7}{5-2x}}} - \frac{25}{48}\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}\sqrt{5x+7} - \frac{2135\sqrt{2-3x}\sqrt{4x+1}\sqrt{5x+7}}{192\sqrt{2x-5}}$$

[Out] $(-2135*\text{Sqrt}[2 - 3*x]*\text{Sqrt}[1 + 4*x]*\text{Sqrt}[7 + 5*x])/(192*\text{Sqrt}[-5 + 2*x]) - (25*\text{Sqrt}[2 - 3*x]*\text{Sqrt}[-5 + 2*x]*\text{Sqrt}[1 + 4*x]*\text{Sqrt}[7 + 5*x])/48 + (2135*\text{Sqrt}[143/3]*\text{Sqrt}[2 - 3*x]*\text{Sqrt}[(7 + 5*x)/(5 - 2*x)]*\text{EllipticE}[\text{ArcSin}[(\text{Sqrt}[39/2]*\text{Sqrt}[1 + 4*x])/\text{Sqrt}[-5 + 2*x]], -23/39])/(128*\text{Sqrt}[(2 - 3*x)/(5 - 2*x)]*\text{Sqrt}[7 + 5*x]) + (29047*\text{Sqrt}[23/11]*\text{Sqrt}[7 + 5*x]*\text{EllipticF}[\text{ArcTan}[\text{Sqrt}[1 + 4*x]/(\text{Sqrt}[2]*\text{Sqrt}[2 - 3*x])], -39/23])/(576*\text{Sqrt}[-5 + 2*x]*\text{Sqrt}[(7 + 5*x)/(5 - 2*x)]) - (3431855*(2 - 3*x)*\text{Sqrt}[(5 - 2*x)/(2 - 3*x)]*\text{Sqrt}[-((1 + 4*x)/(2 - 3*x))]*\text{EllipticPi}[-69/55, \text{ArcSin}[(\text{Sqrt}[11/23]*\text{Sqrt}[7 + 5*x])/\text{Sqrt}[2 - 3*x]], -23/39])/(576*\text{Sqrt}[429]*\text{Sqrt}[-5 + 2*x]*\text{Sqrt}[1 + 4*x])$

Rubi [A] time = 0.318894, antiderivative size = 351, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 9, integrand size = 37, $\frac{\text{number of rules}}{\text{integrand size}} = 0.243$, Rules used = {167, 1602, 1598, 170, 418, 165, 537, 176, 424}

$$-\frac{25}{48}\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}\sqrt{5x+7} - \frac{2135\sqrt{2-3x}\sqrt{4x+1}\sqrt{5x+7}}{192\sqrt{2x-5}} + \frac{29047\sqrt{\frac{23}{11}}\sqrt{5x+7}\text{F}\left(\tan^{-1}\left(\frac{\sqrt{4x+1}}{\sqrt{2}\sqrt{2-3x}}\right)\middle| -\frac{39}{23}\right)}{576\sqrt{2x-5}\sqrt{\frac{5x+7}{5-2x}}}$$

Antiderivative was successfully verified.

[In] $\text{Int}[(7 + 5*x)^{(5/2)}/(\text{Sqrt}[2 - 3*x]*\text{Sqrt}[-5 + 2*x]*\text{Sqrt}[1 + 4*x]), x]$

[Out] $(-2135*\text{Sqrt}[2 - 3*x]*\text{Sqrt}[1 + 4*x]*\text{Sqrt}[7 + 5*x])/(192*\text{Sqrt}[-5 + 2*x]) - (25*\text{Sqrt}[2 - 3*x]*\text{Sqrt}[-5 + 2*x]*\text{Sqrt}[1 + 4*x]*\text{Sqrt}[7 + 5*x])/48 + (2135*\text{Sqrt}[143/3]*\text{Sqrt}[2 - 3*x]*\text{Sqrt}[(7 + 5*x)/(5 - 2*x)]*\text{EllipticE}[\text{ArcSin}[(\text{Sqrt}[39/2]*\text{Sqrt}[1 + 4*x])/\text{Sqrt}[-5 + 2*x]], -23/39])/(128*\text{Sqrt}[(2 - 3*x)/(5 - 2*x)]*\text{Sqrt}[7 + 5*x]) + (29047*\text{Sqrt}[23/11]*\text{Sqrt}[7 + 5*x]*\text{EllipticF}[\text{ArcTan}[\text{Sqrt}[1 + 4*x]/(\text{Sqrt}[2]*\text{Sqrt}[2 - 3*x])], -39/23])/(576*\text{Sqrt}[-5 + 2*x]*\text{Sqrt}[(7 + 5*x)/(5 - 2*x)]) - (3431855*(2 - 3*x)*\text{Sqrt}[(5 - 2*x)/(2 - 3*x)]*\text{Sqrt}[-((1 + 4*x)/(2 - 3*x))]*\text{EllipticPi}[-69/55, \text{ArcSin}[(\text{Sqrt}[11/23]*\text{Sqrt}[7 + 5*x])/\text{Sqrt}[2 - 3*x]], -23/39])/(576*\text{Sqrt}[429]*\text{Sqrt}[-5 + 2*x]*\text{Sqrt}[1 + 4*x])$

- 3*x]], -23/39))/(576*Sqrt[429]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])

Rule 167

Int[((a_.) + (b_.)*(x_))^(m_)/(Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Simp[(2*b^2*(a + b*x)^(m - 2)*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x))/(d*f*h*(2*m - 1)), x] - Dist[1/(d*f*h*(2*m - 1)), Int[((a + b*x)^(m - 3)/(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]))*Simp[a*b^2*(d*e*g + c*f*g + c*e*h) + 2*b^3*c*e*g*(m - 2) - a^3*d*f*h*(2*m - 1) + b*(2*a*b*(d*f*g + d*e*h + c*f*h) + b^2*(2*m - 3)*(d*e*g + c*f*g + c*e*h) - 3*a^2*d*f*h*(2*m - 1))*x - 2*b^2*(m - 1)*(3*a*d*f*h - b*(d*f*g + d*e*h + c*f*h))*x^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x] && IntegerQ[2*m] && GeQ[m, 2]

Rule 1602

Int[((A_.) + (B_.)*(x_) + (C_.)*(x_)^2)/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Simp[(C*Sqrt[a + b*x]*Sqrt[e + f*x]*Sqrt[g + h*x))/(b*f*h*Sqrt[c + d*x]), x] + (Dist[1/(2*b*d*f*h), Int[(1*Simp[2*A*b*d*f*h - C*(b*d*e*g + a*c*f*h) + (2*b*B*d*f*h - C*(a*d*f*h + b*(d*f*g + d*e*h + c*f*h)))*x, x])/(Sqrt[a + b*x]*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]), x], x] + Dist[(C*(d*e - c*f)*(d*g - c*h))/(2*b*d*f*h), Int[Sqrt[a + b*x]/((c + d*x)^(3/2)*Sqrt[e + f*x]*Sqrt[g + h*x]), x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, A, B, C}, x]

Rule 1598

Int[((A_.) + (B_.)*(x_))/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Dist[(A*b - a*B)/b, Int[1/(Sqrt[a + b*x]*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]), x], x] + Dist[B/b, Int[Sqrt[a + b*x]/(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]), x], x] /; FreeQ[{a, b, c, d, e, f, g, h, A, B}, x]

Rule 170

Int[1/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Dist[(2*Sqrt[g + h*x]*Sqrt[(b*e - a*f)*(c + d*x)]/((d*e - c*f)*(a + b*x)))/((f*g - e*h)*Sqrt[c + d*x]*Sqrt[-((b*e - a*f)*(g + h*x))/((f*g - e*h)*(a + b*x))]), Subst[Int[1/Sqrt[1 + ((b*c - a*d)*x^2)/(d*e - c*f]]*Sqrt[1 - ((b*g - a*h)*x^2)/(f*g - e*h)], x], x, Sqrt[e + f*x]/Sqrt[a + b*x]], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x]

Rule 418

```
Int[1/(Sqrt[(a_) + (b_.)*(x_)^2]*Sqrt[(c_) + (d_.)*(x_)^2]), x_Symbol] := S
imp[(Sqrt[a + b*x^2]*EllipticF[ArcTan[Rt[d/c, 2]*x], 1 - (b*c)/(a*d)]/(a*R
t[d/c, 2]*Sqrt[c + d*x^2]*Sqrt[(c*(a + b*x^2))/(a*(c + d*x^2))]), x] /; Fre
eQ[{a, b, c, d}, x] && PosQ[d/c] && PosQ[b/a] && !SimplerSqrtQ[b/a, d/c]
```

Rule 165

```
Int[Sqrt[(a_.) + (b_.)*(x_)]/(Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(
x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Dist[(2*(a + b*x)*Sqrt[((b*g -
a*h)*(c + d*x))/((d*g - c*h)*(a + b*x))]*Sqrt[((b*g - a*h)*(e + f*x))/((f*
g - e*h)*(a + b*x))])/(Sqrt[c + d*x]*Sqrt[e + f*x]), Subst[Int[1/((h - b*x^
2)*Sqrt[1 + ((b*c - a*d)*x^2)/(d*g - c*h)]*Sqrt[1 + ((b*e - a*f)*x^2)/(f*g
- e*h)]), x], x, Sqrt[g + h*x]/Sqrt[a + b*x]], x] /; FreeQ[{a, b, c, d, e,
f, g, h}, x]
```

Rule 537

```
Int[1/(((a_) + (b_.)*(x_)^2)*Sqrt[(c_) + (d_.)*(x_)^2]*Sqrt[(e_) + (f_.)*(x
_)^2]), x_Symbol] := Simp[(1*EllipticPi[(b*c)/(a*d), ArcSin[Rt[-(d/c), 2]*x
], (c*f)/(d*e)]/(a*Sqrt[c]*Sqrt[e]*Rt[-(d/c), 2]), x] /; FreeQ[{a, b, c, d
, e, f}, x] && !GtQ[d/c, 0] && GtQ[c, 0] && GtQ[e, 0] && !( !GtQ[f/e, 0]
&& SimplerSqrtQ[-(f/e), -(d/c)])
```

Rule 176

```
Int[Sqrt[(c_.) + (d_.)*(x_)]/(((a_.) + (b_.)*(x_))^(3/2)*Sqrt[(e_.) + (f_.)
*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Dist[(-2*Sqrt[c + d*x]*Sqrt[
-(((b*e - a*f)*(g + h*x))/((f*g - e*h)*(a + b*x)))]/(b*e - a*f)*Sqrt[g +
h*x]*Sqrt[((b*e - a*f)*(c + d*x))/((d*e - c*f)*(a + b*x))]), Subst[Int[Sqrt
[1 + ((b*c - a*d)*x^2)/(d*e - c*f)]/Sqrt[1 - ((b*g - a*h)*x^2)/(f*g - e*h)]
, x], x, Sqrt[e + f*x]/Sqrt[a + b*x]], x] /; FreeQ[{a, b, c, d, e, f, g, h}
, x]
```

Rule 424

```
Int[Sqrt[(a_) + (b_.)*(x_)^2]/Sqrt[(c_) + (d_.)*(x_)^2], x_Symbol] := Simp[
(Sqrt[a]*EllipticE[ArcSin[Rt[-(d/c), 2]*x], (b*c)/(a*d)]/(Sqrt[c]*Rt[-(d/c
), 2]), x] /; FreeQ[{a, b, c, d}, x] && NegQ[d/c] && GtQ[c, 0] && GtQ[a, 0]
```

Rubi steps

$$\begin{aligned}
\int \frac{(7+5x)^{5/2}}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}} dx &= -\frac{25}{48}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}\sqrt{7+5x} + \frac{1}{96} \int \frac{28003+89810x+64050x^2}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}\sqrt{7+5x}} dx \\
&= -\frac{2135\sqrt{2-3x}\sqrt{1+4x}\sqrt{7+5x}}{192\sqrt{-5+2x}} - \frac{25}{48}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}\sqrt{7+5x} - \frac{\int \frac{87793}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}\sqrt{7+5x}} dx}{192\sqrt{-5+2x}} \\
&= -\frac{2135\sqrt{2-3x}\sqrt{1+4x}\sqrt{7+5x}}{192\sqrt{-5+2x}} - \frac{25}{48}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}\sqrt{7+5x} - \frac{553525}{192\sqrt{-5+2x}} \int \frac{1}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}\sqrt{7+5x}} dx \\
&= -\frac{2135\sqrt{2-3x}\sqrt{1+4x}\sqrt{7+5x}}{192\sqrt{-5+2x}} - \frac{25}{48}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}\sqrt{7+5x} + \frac{2135\sqrt{\frac{143}{3}}}{192\sqrt{-5+2x}} \\
&= -\frac{2135\sqrt{2-3x}\sqrt{1+4x}\sqrt{7+5x}}{192\sqrt{-5+2x}} - \frac{25}{48}\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}\sqrt{7+5x} + \frac{2135\sqrt{\frac{143}{3}}}{192\sqrt{-5+2x}}
\end{aligned}$$

Mathematica [A] time = 2.43074, size = 347, normalized size = 0.99

$$\sqrt{2x-5}\sqrt{4x+1}\sqrt{5x+7} \left(\frac{17113116\sqrt{682}(3x-2)(5x+7)\sqrt{\frac{8x^2-18x-5}{(2-3x)^2}} \text{EllipticF}\left(\sin^{-1}\left(\sqrt{\frac{31}{39}}\sqrt{\frac{2x-5}{3x-2}}\right), \frac{39}{62}\right) - 13104630\sqrt{682}(3x-2)(5x+7)\sqrt{\frac{8x^2-18x-5}{(2-3x)^2}} E\left(\sin^{-1}\left(\sqrt{\frac{31}{39}}\sqrt{\frac{2x-5}{3x-2}}\right), \frac{39}{62}\right)}{(2-3x)^2} \right)$$

23569

Warning: Unable to verify antiderivative.

[In] Integrate[(7 + 5*x)^(5/2)/(Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]), x]

[Out] (Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*Sqrt[7 + 5*x]*(1227600*(-2 + 3*x) + (-13104630*Sqrt[682]*(-2 + 3*x)*(7 + 5*x)*Sqrt[(-5 - 18*x + 8*x^2)/(2 - 3*x)^2]*EllipticE[ArcSin[Sqrt[31/39]*Sqrt[(-5 + 2*x)/(-2 + 3*x)]], 39/62] + 17113116*Sqrt[682]*(-2 + 3*x)*(7 + 5*x)*Sqrt[(-5 - 18*x + 8*x^2)/(2 - 3*x)^2]*EllipticF[ArcSin[Sqrt[31/39]*Sqrt[(-5 + 2*x)/(-2 + 3*x)]], 39/62] - 385*Sqrt[(7 + 5*x)/(-2 + 3*x)]*(-102114*(-35 - 151*x - 34*x^2 + 40*x^3) - 47445*Sqrt[682]*(2 - 3*x)^2*Sqrt[(1 + 4*x)/(-2 + 3*x)]*Sqrt[(-35 - 11*x + 10*x^2)/(2 - 3*x)^2]*EllipticPi[117/62, ArcSin[Sqrt[31/39]*Sqrt[(-5 + 2*x)/(-2 + 3*x)]], 39/62])))/((2 - 3*x)*((7 + 5*x)/(-2 + 3*x))^(3/2)*(5 + 18*x - 8*x^2)))/(235699

$2*\text{Sqrt}[2 - 3*x]$

Maple [B] time = 0.037, size = 880, normalized size = 2.5

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] $\text{int}((7+5*x)^{(5/2)}/(2-3*x)^{(1/2)}/(2*x-5)^{(1/2)}/(4*x+1)^{(1/2)}, x)$

[Out] $\frac{1}{329472}(7+5x)^{1/2}(2-3x)^{1/2}(2x-5)^{1/2}(4x+1)^{1/2}(11088208*11^{1/2}*((7+5x)/(4x+1))^{1/2}*3^{1/2}*13^{1/2}*((2x-5)/(4x+1))^{1/2}*((-2+3x)/(4x+1))^{1/2}*x^2*\text{EllipticF}(1/31*31^{1/2}*11^{1/2}*((7+5x)/(4x+1))^{1/2}, 1/39*31^{1/2}*78^{1/2})-40739440*11^{1/2}*((7+5x)/(4x+1))^{1/2}*3^{1/2}*13^{1/2}*((2x-5)/(4x+1))^{1/2}*((-2+3x)/(4x+1))^{1/2}*x^2*\text{EllipticPi}(1/31*31^{1/2}*11^{1/2}*((7+5x)/(4x+1))^{1/2}, 124/55, 1/39*31^{1/2}*78^{1/2})-29309280*11^{1/2}*((7+5x)/(4x+1))^{1/2}*3^{1/2}*13^{1/2}*((2x-5)/(4x+1))^{1/2}*((-2+3x)/(4x+1))^{1/2}*x^2*\text{EllipticE}(1/31*31^{1/2}*11^{1/2}*((7+5x)/(4x+1))^{1/2}, 1/39*31^{1/2}*78^{1/2})+5544104*11^{1/2}*((7+5x)/(4x+1))^{1/2}*3^{1/2}*13^{1/2}*((2x-5)/(4x+1))^{1/2}*((-2+3x)/(4x+1))^{1/2}*x*\text{EllipticF}(1/31*31^{1/2}*11^{1/2}*((7+5x)/(4x+1))^{1/2}, 1/39*31^{1/2}*78^{1/2})-20369720*11^{1/2}*((7+5x)/(4x+1))^{1/2}*3^{1/2}*13^{1/2}*((2x-5)/(4x+1))^{1/2}*((-2+3x)/(4x+1))^{1/2}*x*\text{EllipticPi}(1/31*31^{1/2}*11^{1/2}*((7+5x)/(4x+1))^{1/2}, 124/55, 1/39*31^{1/2}*78^{1/2})-14654640*11^{1/2}*((7+5x)/(4x+1))^{1/2}*3^{1/2}*13^{1/2}*((2x-5)/(4x+1))^{1/2}*((-2+3x)/(4x+1))^{1/2}*x*\text{EllipticE}(1/31*31^{1/2}*11^{1/2}*((7+5x)/(4x+1))^{1/2}, 1/39*31^{1/2}*78^{1/2})+693013*11^{1/2}*((7+5x)/(4x+1))^{1/2}*3^{1/2}*13^{1/2}*((2x-5)/(4x+1))^{1/2}*((-2+3x)/(4x+1))^{1/2}*\text{EllipticF}(1/31*31^{1/2}*11^{1/2}*((7+5x)/(4x+1))^{1/2}, 1/39*31^{1/2}*78^{1/2})-2546215*11^{1/2}*((7+5x)/(4x+1))^{1/2}*3^{1/2}*13^{1/2}*((2x-5)/(4x+1))^{1/2}*((-2+3x)/(4x+1))^{1/2}*\text{EllipticPi}(1/31*31^{1/2}*11^{1/2}*((7+5x)/(4x+1))^{1/2}, 124/55, 1/39*31^{1/2}*78^{1/2})-1831830*11^{1/2}*((7+5x)/(4x+1))^{1/2}*3^{1/2}*13^{1/2}*((2x-5)/(4x+1))^{1/2}*((-2+3x)/(4x+1))^{1/2}*\text{EllipticE}(1/31*31^{1/2}*11^{1/2}*((7+5x)/(4x+1))^{1/2}, 1/39*31^{1/2}*78^{1/2})-188588400*x^3-20592000*x^4+454413960*x^2+574362360*x-524924400)/(120*x^4-182*x^3-385*x^2+197*x+70)$

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(5x+7)^{\frac{5}{2}}}{\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((7+5*x)^(5/2)/(2-3*x)^(1/2)/(-5+2*x)^(1/2)/(1+4*x)^(1/2),x, algorithm="maxima")

[Out] integrate((5*x + 7)^(5/2)/(sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)), x)

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{(25x^2 + 70x + 49)\sqrt{5x+7}\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2}}{24x^3 - 70x^2 + 21x + 10}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((7+5*x)^(5/2)/(2-3*x)^(1/2)/(-5+2*x)^(1/2)/(1+4*x)^(1/2),x, algorithm="fricas")

[Out] integral(-(25*x^2 + 70*x + 49)*sqrt(5*x + 7)*sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)/(24*x^3 - 70*x^2 + 21*x + 10), x)

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((7+5*x)**(5/2)/(2-3*x)**(1/2)/(-5+2*x)**(1/2)/(1+4*x)**(1/2),x)

[Out] Timed out

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(5x+7)^{\frac{5}{2}}}{\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((7+5*x)^(5/2)/(2-3*x)^(1/2)/(-5+2*x)^(1/2)/(1+4*x)^(1/2),x, algorith="giac")
```

```
[Out] integrate((5*x + 7)^(5/2)/(sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)), x)
```

$$3.102 \quad \int \frac{(7+5x)^{3/2}}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}} dx$$

Optimal. Leaf size=469

$$\frac{65\sqrt{\frac{11}{23}}\sqrt{5x+7}\text{EllipticF}\left(\tan^{-1}\left(\frac{\sqrt{4x+1}}{\sqrt{2}\sqrt{2-3x}}\right), -\frac{39}{23}\right)}{8\sqrt{2x-5}\sqrt{\frac{5x+7}{5-2x}}} - \frac{895\sqrt{\frac{11}{62}}\sqrt{2-3x}\text{EllipticF}\left(\tan^{-1}\left(\frac{\sqrt{\frac{22}{23}}\sqrt{5x+7}}{\sqrt{2x-5}}\right), \frac{39}{62}\right)}{48\sqrt{-\frac{2-3x}{4x+1}}\sqrt{4x+1}} - \frac{5\sqrt{2-3x}\sqrt{4x+1}}{12\sqrt{2x-5}}$$

[Out] (-5*Sqrt[2 - 3*x]*Sqrt[1 + 4*x]*Sqrt[7 + 5*x])/(12*Sqrt[-5 + 2*x]) + (5*Sqrt[143/3]*Sqrt[2 - 3*x]*Sqrt[(7 + 5*x)/(5 - 2*x)]*EllipticE[ArcSin[(Sqrt[39/23]*Sqrt[1 + 4*x])/Sqrt[-5 + 2*x]], -23/39])/(8*Sqrt[(2 - 3*x)/(5 - 2*x)]*Sqrt[7 + 5*x]) + (65*Sqrt[11/23]*Sqrt[7 + 5*x]*EllipticF[ArcTan[Sqrt[1 + 4*x]/(Sqrt[2]*Sqrt[2 - 3*x])], -39/23])/(8*Sqrt[-5 + 2*x]*Sqrt[(7 + 5*x)/(5 - 2*x)]) - (895*Sqrt[11/62]*Sqrt[2 - 3*x]*EllipticF[ArcTan[(Sqrt[22/23]*Sqrt[7 + 5*x])/Sqrt[-5 + 2*x]], 39/62])/(48*Sqrt[-((2 - 3*x)/(1 + 4*x))]*Sqrt[1 + 4*x]) + (23*Sqrt[31/22]*Sqrt[(2 - 3*x)/(7 + 5*x)]*Sqrt[(5 - 2*x)/(7 + 5*x)])*(7 + 5*x)*EllipticPi[55/124, ArcSin[(Sqrt[31/11]*Sqrt[1 + 4*x])/Sqrt[7 + 5*x]], 39/62])/(6*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]) - (4117*Sqrt[2 - 3*x]*EllipticPi[78/55, ArcTan[(Sqrt[22/23]*Sqrt[7 + 5*x])/Sqrt[-5 + 2*x]], 39/62])/(48*Sqrt[682]*Sqrt[-((2 - 3*x)/(1 + 4*x))]*Sqrt[1 + 4*x])

Rubi [A] time = 0.280348, antiderivative size = 469, normalized size of antiderivative = 1., number of steps used = 12, number of rules used = 10, integrand size = 37, $\frac{\text{number of rules}}{\text{integrand size}} = 0.27$, Rules used = {166, 173, 176, 424, 170, 418, 165, 536, 539, 537}

$$-\frac{5\sqrt{2-3x}\sqrt{4x+1}\sqrt{5x+7}}{12\sqrt{2x-5}} + \frac{65\sqrt{\frac{11}{23}}\sqrt{5x+7}F\left(\tan^{-1}\left(\frac{\sqrt{4x+1}}{\sqrt{2}\sqrt{2-3x}}\right), -\frac{39}{23}\right)}{8\sqrt{2x-5}\sqrt{\frac{5x+7}{5-2x}}} - \frac{895\sqrt{\frac{11}{62}}\sqrt{2-3x}F\left(\tan^{-1}\left(\frac{\sqrt{\frac{22}{23}}\sqrt{5x+7}}{\sqrt{2x-5}}\right), \frac{39}{62}\right)}{48\sqrt{-\frac{2-3x}{4x+1}}\sqrt{4x+1}} +$$

Antiderivative was successfully verified.

[In] Int[(7 + 5*x)^(3/2)/(Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]), x]

[Out] (-5*Sqrt[2 - 3*x]*Sqrt[1 + 4*x]*Sqrt[7 + 5*x])/(12*Sqrt[-5 + 2*x]) + (5*Sqrt[143/3]*Sqrt[2 - 3*x]*Sqrt[(7 + 5*x)/(5 - 2*x)]*EllipticE[ArcSin[(Sqrt[39/23]*Sqrt[1 + 4*x])/Sqrt[-5 + 2*x]], -23/39])/(8*Sqrt[(2 - 3*x)/(5 - 2*x)]*Sqrt[7 + 5*x]) + (65*Sqrt[11/23]*Sqrt[7 + 5*x]*EllipticF[ArcTan[Sqrt[1 + 4*x]/(Sqrt[2]*Sqrt[2 - 3*x])], -39/23])/(8*Sqrt[-5 + 2*x]*Sqrt[(7 + 5*x)/(5 - 2*x)]) - (895*Sqrt[11/62]*Sqrt[2 - 3*x]*EllipticF[ArcTan[(Sqrt[22/23]*Sqrt[7 + 5*x])/Sqrt[-5 + 2*x]], 39/62])/(48*Sqrt[-((2 - 3*x)/(1 + 4*x))]*Sqrt[1 + 4*x])

```

7 + 5*x])/Sqrt[-5 + 2*x]], 39/62)]/(48*Sqrt[-((2 - 3*x)/(1 + 4*x))]*Sqrt[1
+ 4*x]) + (23*Sqrt[31/22]*Sqrt[(2 - 3*x)/(7 + 5*x)]*Sqrt[(5 - 2*x)/(7 + 5*x
) ]*(7 + 5*x)*EllipticPi[55/124, ArcSin[(Sqrt[31/11]*Sqrt[1 + 4*x])/Sqrt[7 +
5*x]], 39/62)]/(6*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]) - (4117*Sqrt[2 - 3*x]*Elli
pticPi[78/55, ArcTan[(Sqrt[22/23]*Sqrt[7 + 5*x])/Sqrt[-5 + 2*x]], 39/62)]/(
48*Sqrt[682]*Sqrt[-((2 - 3*x)/(1 + 4*x))]*Sqrt[1 + 4*x])

```

Rule 166

```

Int[((a_.) + (b_.)*(x_))^(3/2)/(Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)
*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Dist[b/d, Int[(Sqrt[a + b*x]
*Sqrt[c + d*x])/(Sqrt[e + f*x]*Sqrt[g + h*x]), x], x] - Dist[(b*c - a*d)/d,
Int[Sqrt[a + b*x]/(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]), x], x] /; F
reeQ[{a, b, c, d, e, f, g, h}, x]

```

Rule 173

```

Int[(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)])/(Sqrt[(e_.) + (f_.)
*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Simp[(Sqrt[a + b*x]*Sqrt[c +
d*x]*Sqrt[g + h*x])/(h*Sqrt[e + f*x]), x] + (-Dist[((d*e - c*f)*(f*g - e*h
))/(2*f*h), Int[Sqrt[a + b*x]/(Sqrt[c + d*x]*(e + f*x)^(3/2)*Sqrt[g + h*x])
, x], x] + Dist[((d*e - c*f)*(b*f*g + b*e*h - 2*a*f*h))/(2*f^2*h), Int[1/(S
qrt[a + b*x]*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]), x], x] + Dist[(a*d
*f*h - b*(d*f*g + d*e*h - c*f*h))/(2*f^2*h), Int[Sqrt[e + f*x]/(Sqrt[a + b*
x]*Sqrt[c + d*x]*Sqrt[g + h*x]), x], x]) /; FreeQ[{a, b, c, d, e, f, g, h},
x]

```

Rule 176

```

Int[Sqrt[(c_.) + (d_.)*(x_)]/(((a_.) + (b_.)*(x_))^(3/2)*Sqrt[(e_.) + (f_.)
*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Dist[(-2*Sqrt[c + d*x]*Sqrt[
-(((b*e - a*f)*(g + h*x))/((f*g - e*h)*(a + b*x)))])/((b*e - a*f)*Sqrt[g +
h*x]*Sqrt[((b*e - a*f)*(c + d*x))/((d*e - c*f)*(a + b*x))]), Subst[Int[Sqrt
[1 + ((b*c - a*d)*x^2)/(d*e - c*f)]/Sqrt[1 - ((b*g - a*h)*x^2)/(f*g - e*h)]
, x], x, Sqrt[e + f*x]/Sqrt[a + b*x]], x] /; FreeQ[{a, b, c, d, e, f, g, h}
, x]

```

Rule 424

```

Int[Sqrt[(a_.) + (b_.)*(x_)^2]/Sqrt[(c_.) + (d_.)*(x_)^2], x_Symbol] := Simp[
(Sqrt[a]*EllipticE[ArcSin[Rt[-(d/c), 2]*x], (b*c)/(a*d)]/(Sqrt[c]*Rt[-(d/c
), 2]), x] /; FreeQ[{a, b, c, d}, x] && NegQ[d/c] && GtQ[c, 0] && GtQ[a, 0]

```

Rule 170

```

Int[1/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)
*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Dist[(2*Sqrt[g + h*x]*Sqrt[(
(b*e - a*f)*(c + d*x))/((d*e - c*f)*(a + b*x))])/((f*g - e*h)*Sqrt[c + d*x]
*Sqrt[-((b*e - a*f)*(g + h*x))/((f*g - e*h)*(a + b*x))]), Subst[Int[1/(Sq
rt[1 + ((b*c - a*d)*x^2)/(d*e - c*f)]*Sqrt[1 - ((b*g - a*h)*x^2)/(f*g - e*h
]]), x], x, Sqrt[e + f*x]/Sqrt[a + b*x]], x] /; FreeQ[{a, b, c, d, e, f, g,
h}, x]

```

Rule 418

```

Int[1/(Sqrt[(a_) + (b_)*(x_)^2]*Sqrt[(c_) + (d_)*(x_)^2]), x_Symbol] := S
imp[(Sqrt[a + b*x^2]*EllipticF[ArcTan[Rt[d/c, 2]*x], 1 - (b*c)/(a*d)])/(a*R
t[d/c, 2]*Sqrt[c + d*x^2]*Sqrt[(c*(a + b*x^2))/(a*(c + d*x^2))]), x] /; Fre
eQ[{a, b, c, d}, x] && PosQ[d/c] && PosQ[b/a] && !SimplerSqrtQ[b/a, d/c]

```

Rule 165

```

Int[Sqrt[(a_.) + (b_.)*(x_)]/(Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(
x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Dist[(2*(a + b*x)*Sqrt[((b*g -
a*h)*(c + d*x))/((d*g - c*h)*(a + b*x))]*Sqrt[((b*g - a*h)*(e + f*x))/((f*
g - e*h)*(a + b*x))])/(Sqrt[c + d*x]*Sqrt[e + f*x]), Subst[Int[1/((h - b*x^
2)*Sqrt[1 + ((b*c - a*d)*x^2)/(d*g - c*h)]*Sqrt[1 + ((b*e - a*f)*x^2)/(f*g
- e*h)]), x], x, Sqrt[g + h*x]/Sqrt[a + b*x]], x] /; FreeQ[{a, b, c, d, e,
f, g, h}, x]

```

Rule 536

```

Int[1/(((a_) + (b_)*(x_)^2)*Sqrt[(c_) + (d_)*(x_)^2]*Sqrt[(e_) + (f_.)*(x
_)^2]), x_Symbol] := -Dist[f/(b*e - a*f), Int[1/(Sqrt[c + d*x^2]*Sqrt[e + f
*x^2]), x], x] + Dist[b/(b*e - a*f), Int[Sqrt[e + f*x^2]/((a + b*x^2)*Sqrt[
c + d*x^2]), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[d/c, 0] && GtQ[f
/e, 0] && !SimplerSqrtQ[d/c, f/e]

```

Rule 539

```

Int[Sqrt[(c_) + (d_.)*(x_)^2]/(((a_) + (b_.)*(x_)^2)*Sqrt[(e_) + (f_.)*(x_)
^2]), x_Symbol] := Simp[(c*Sqrt[e + f*x^2]*EllipticPi[1 - (b*c)/(a*d), ArcT
an[Rt[d/c, 2]*x], 1 - (c*f)/(d*e)]/(a*e*Rt[d/c, 2]*Sqrt[c + d*x^2]*Sqrt[(c
*(e + f*x^2))/(e*(c + d*x^2))]), x] /; FreeQ[{a, b, c, d, e, f}, x] && PosQ
[d/c]

```

Rule 537

```

Int[1/(((a_) + (b_.)*(x_)^2)*Sqrt[(c_) + (d_.)*(x_)^2]*Sqrt[(e_) + (f_.)*(x
_)^2]), x_Symbol] := Simp[(1*EllipticPi[(b*c)/(a*d), ArcSin[Rt[-(d/c), 2]*x

```


], (c*f)/(d*e)]/(a*Sqrt[c]*Sqrt[e]*Rt[-(d/c), 2]), x] /; FreeQ[{a, b, c, d, e, f}, x] && !GtQ[d/c, 0] && GtQ[c, 0] && GtQ[e, 0] && !(!GtQ[f/e, 0] && SimplerSqrtQ[-(f/e), -(d/c)])

Rubi steps

$$\begin{aligned}
 \int \frac{(7+5x)^{3/2}}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}} dx &= -\left(\frac{5}{3} \int \frac{\sqrt{2-3x}\sqrt{7+5x}}{\sqrt{-5+2x}\sqrt{1+4x}} dx\right) + \frac{31}{3} \int \frac{\sqrt{7+5x}}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}} dx \\
 &= -\frac{5\sqrt{2-3x}\sqrt{1+4x}\sqrt{7+5x}}{12\sqrt{-5+2x}} + \frac{895}{48} \int \frac{\sqrt{-5+2x}}{\sqrt{2-3x}\sqrt{1+4x}\sqrt{7+5x}} dx + \frac{715}{16} \int \frac{1}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}} dx \\
 &= -\frac{5\sqrt{2-3x}\sqrt{1+4x}\sqrt{7+5x}}{12\sqrt{-5+2x}} + \frac{23\sqrt{\frac{31}{22}}\sqrt{\frac{2-3x}{7+5x}}\sqrt{\frac{5-2x}{7+5x}}(7+5x)\Pi\left(\frac{55}{124}; \sin^{-1}\left(\frac{\sqrt{\frac{31}{11}}\sqrt{1+4x}}{\sqrt{7+5x}}\right)\right)}{6\sqrt{2-3x}\sqrt{-5+2x}} \\
 &= -\frac{5\sqrt{2-3x}\sqrt{1+4x}\sqrt{7+5x}}{12\sqrt{-5+2x}} + \frac{5\sqrt{\frac{143}{3}}\sqrt{2-3x}\sqrt{\frac{7+5x}{5-2x}}E\left(\sin^{-1}\left(\frac{\sqrt{\frac{39}{23}}\sqrt{1+4x}}{\sqrt{-5+2x}}\right)\right) - \frac{23}{39}}{8\sqrt{\frac{2-3x}{5-2x}}\sqrt{7+5x}} + \\
 &= -\frac{5\sqrt{2-3x}\sqrt{1+4x}\sqrt{7+5x}}{12\sqrt{-5+2x}} + \frac{5\sqrt{\frac{143}{3}}\sqrt{2-3x}\sqrt{\frac{7+5x}{5-2x}}E\left(\sin^{-1}\left(\frac{\sqrt{\frac{39}{23}}\sqrt{1+4x}}{\sqrt{-5+2x}}\right)\right) - \frac{23}{39}}{8\sqrt{\frac{2-3x}{5-2x}}\sqrt{7+5x}} +
 \end{aligned}$$

Mathematica [A] time = 1.2229, size = 347, normalized size = 0.74

$$\frac{\sqrt{2x-5} \left(-6969\sqrt{341}\sqrt{\frac{3x-2}{4x+1}}\sqrt{\frac{5x+7}{4x+1}}(8x^2-18x-5) \operatorname{EllipticF}\left(\sin^{-1}\left(\sqrt{\frac{22}{39}}\sqrt{\frac{5x+7}{4x+1}}\right), \frac{39}{62}\right) + 6820\sqrt{341}\sqrt{\frac{3x-2}{4x+1}}\sqrt{\frac{5x+7}{4x+1}}(8x^2-18x-5) \operatorname{EllipticE}\left(\sin^{-1}\left(\sqrt{\frac{22}{39}}\sqrt{\frac{5x+7}{4x+1}}\right), \frac{39}{62}\right) \right)}{16}$$

16

Warning: Unable to verify antiderivative.

[In] Integrate[(7 + 5*x)^(3/2)/(Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]),x]

[Out] (Sqrt[-5 + 2*x]*(6820*Sqrt[341]*Sqrt[(-2 + 3*x)/(1 + 4*x)]*Sqrt[(7 + 5*x)/(1 + 4*x)]*(-5 - 18*x + 8*x^2)*EllipticE[ArcSin[Sqrt[22/39]*Sqrt[(7 + 5*x)/(1 + 4*x)]]] + 6820*Sqrt[341]*Sqrt[(-2 + 3*x)/(1 + 4*x)]*Sqrt[(7 + 5*x)/(1 + 4*x)]*(-5 - 18*x + 8*x^2)*EllipticF[ArcSin[Sqrt[22/39]*Sqrt[(7 + 5*x)/(1 + 4*x)]]], 39/62)/16

$$\begin{aligned} & 1 + 4x)]]], 39/62] - 6969*\text{Sqrt}[341]*\text{Sqrt}[(-2 + 3x)/(1 + 4x)]*\text{Sqrt}[(7 + 5x)/(1 + 4x)]*(-5 - 18x + 8x^2)*\text{EllipticF}[\text{ArcSin}[\text{Sqrt}[22/39]*\text{Sqrt}[(7 + 5x)/(1 + 4x)]]], 39/62] + \text{Sqrt}[(-5 + 2x)/(1 + 4x)]*(13640*\text{Sqrt}[2]*(70 - 83x - 53x^2 + 30x^3) + 9821*\text{Sqrt}[341]*\text{Sqrt}[(-2 + 3x)/(1 + 4x)]*(1 + 4x)^2*\text{Sqrt}[(-35 - 11x + 10x^2)/(1 + 4x)^2]*\text{EllipticPi}[78/55, \text{ArcSin}[\text{Sqrt}[22/39]*\text{Sqrt}[(7 + 5x)/(1 + 4x)]]], 39/62]))/((16368*\text{Sqrt}[4 - 6x]*((-5 + 2x)/(1 + 4x))^(3/2)*(1 + 4x)^(3/2)*\text{Sqrt}[7 + 5x]) \end{aligned}$$

Maple [A] time = 0.023, size = 875, normalized size = 1.9

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] $\text{int}((7+5*x)^{(3/2)}/(2-3*x)^{(1/2)}/(2*x-5)^{(1/2)}/(4*x+1)^{(1/2)}, x)$

[Out] $\frac{1}{20592}*(7+5*x)^{(1/2)}*(2-3*x)^{(1/2)}*(2*x-5)^{(1/2)}*(4*x+1)^{(1/2)}*(71024*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}*3^{(1/2)}*13^{(1/2)}*((2*x-5)/(4*x+1))^{(1/2)}*((-2+3*x)/(4*x+1))^{(1/2)}*x^2*\text{EllipticF}(1/31*31^{(1/2)}*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}, 1/39*31^{(1/2)}*78^{(1/2)})-157136*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}*3^{(1/2)}*13^{(1/2)}*((2*x-5)/(4*x+1))^{(1/2)}*((-2+3*x)/(4*x+1))^{(1/2)}*x^2*\text{EllipticPi}(1/31*31^{(1/2)}*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}, 124/55, 1/39*31^{(1/2)}*78^{(1/2)})-68640*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}*3^{(1/2)}*13^{(1/2)}*((2*x-5)/(4*x+1))^{(1/2)}*((-2+3*x)/(4*x+1))^{(1/2)}*x^2*\text{EllipticE}(1/31*31^{(1/2)}*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}, 1/39*31^{(1/2)}*78^{(1/2)})+35512*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}*3^{(1/2)}*13^{(1/2)}*((2*x-5)/(4*x+1))^{(1/2)}*((-2+3*x)/(4*x+1))^{(1/2)}*x*\text{EllipticF}(1/31*31^{(1/2)}*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}, 1/39*31^{(1/2)}*78^{(1/2)})-78568*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}*3^{(1/2)}*13^{(1/2)}*((2*x-5)/(4*x+1))^{(1/2)}*((-2+3*x)/(4*x+1))^{(1/2)}*x*\text{EllipticPi}(1/31*31^{(1/2)}*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}, 124/55, 1/39*31^{(1/2)}*78^{(1/2)})-34320*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}*3^{(1/2)}*13^{(1/2)}*((2*x-5)/(4*x+1))^{(1/2)}*((-2+3*x)/(4*x+1))^{(1/2)}*x*\text{EllipticE}(1/31*31^{(1/2)}*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}, 1/39*31^{(1/2)}*78^{(1/2)})+4439*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}*3^{(1/2)}*13^{(1/2)}*((2*x-5)/(4*x+1))^{(1/2)}*((-2+3*x)/(4*x+1))^{(1/2)}*\text{EllipticF}(1/31*31^{(1/2)}*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}, 1/39*31^{(1/2)}*78^{(1/2)})-9821*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}*3^{(1/2)}*13^{(1/2)}*((2*x-5)/(4*x+1))^{(1/2)}*((-2+3*x)/(4*x+1))^{(1/2)}*\text{EllipticPi}(1/31*31^{(1/2)}*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}, 124/55, 1/39*31^{(1/2)}*78^{(1/2)})-4290*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}*3^{(1/2)}*13^{(1/2)}*((2*x-5)/(4*x+1))^{(1/2)}*((-2+3*x)/(4*x+1))^{(1/2)}*\text{EllipticE}(1/31*31^{(1/2)}*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}, 1/39*31^{(1/2)}*78^{(1/2)})-514800*x^3+909480*x^2+1424280*x-1201200)/(120*x^4-182*x^3-385*x^2+197*x+70)$

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(5x+7)^{\frac{3}{2}}}{\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((7+5*x)^(3/2)/(2-3*x)^(1/2)/(-5+2*x)^(1/2)/(1+4*x)^(1/2),x, algorithm="maxima")

[Out] integrate((5*x + 7)^(3/2)/(sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)), x)

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{(5x+7)^{\frac{3}{2}}\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2}}{24x^3-70x^2+21x+10}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((7+5*x)^(3/2)/(2-3*x)^(1/2)/(-5+2*x)^(1/2)/(1+4*x)^(1/2),x, algorithm="fricas")

[Out] integral(-(5*x + 7)^(3/2)*sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)/(24*x^3 - 70*x^2 + 21*x + 10), x)

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((7+5*x)**(3/2)/(2-3*x)**(1/2)/(-5+2*x)**(1/2)/(1+4*x)**(1/2),x)

[Out] Timed out

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(5x+7)^{\frac{3}{2}}}{\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((7+5*x)^(3/2)/(2-3*x)^(1/2)/(-5+2*x)^(1/2)/(1+4*x)^(1/2),x, algo-  
rithm="giac")
```

```
[Out] integrate((5*x + 7)^(3/2)/(sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)), x)
```

$$3.103 \quad \int \frac{\sqrt{7+5x}}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}} dx$$

Optimal. Leaf size=100

$$\frac{23\sqrt{\frac{2-3x}{5x+7}}\sqrt{\frac{5-2x}{5x+7}}(5x+7)\Pi\left(\frac{55}{124}; \sin^{-1}\left(\frac{\sqrt{\frac{31}{11}}\sqrt{4x+1}}{\sqrt{5x+7}}\right) \middle| \frac{39}{62}\right)}{2\sqrt{682}\sqrt{2-3x}\sqrt{2x-5}}$$

[Out] (23*Sqrt[(2 - 3*x)/(7 + 5*x)]*Sqrt[(5 - 2*x)/(7 + 5*x)]*(7 + 5*x)*EllipticPi[55/124, ArcSin[(Sqrt[31/11]*Sqrt[1 + 4*x])/Sqrt[7 + 5*x]], 39/62])/(2*Sqrt[682]*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x])

Rubi [A] time = 0.0383713, antiderivative size = 100, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 37, $\frac{\text{number of rules}}{\text{integrand size}} = 0.054$, Rules used = {165, 537}

$$\frac{23\sqrt{\frac{2-3x}{5x+7}}\sqrt{\frac{5-2x}{5x+7}}(5x+7)\Pi\left(\frac{55}{124}; \sin^{-1}\left(\frac{\sqrt{\frac{31}{11}}\sqrt{4x+1}}{\sqrt{5x+7}}\right) \middle| \frac{39}{62}\right)}{2\sqrt{682}\sqrt{2-3x}\sqrt{2x-5}}$$

Antiderivative was successfully verified.

[In] Int[Sqrt[7 + 5*x]/(Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]), x]

[Out] (23*Sqrt[(2 - 3*x)/(7 + 5*x)]*Sqrt[(5 - 2*x)/(7 + 5*x)]*(7 + 5*x)*EllipticPi[55/124, ArcSin[(Sqrt[31/11]*Sqrt[1 + 4*x])/Sqrt[7 + 5*x]], 39/62])/(2*Sqrt[682]*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x])

Rule 165

Int[Sqrt[(a_.) + (b_.)*(x_)]/(Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Dist[(2*(a + b*x)*Sqrt[((b*g - a*h)*(c + d*x))/((d*g - c*h)*(a + b*x))]*Sqrt[((b*g - a*h)*(e + f*x))/((f*g - e*h)*(a + b*x))])/(Sqrt[c + d*x]*Sqrt[e + f*x]), Subst[Int[1/((h - b*x^2)*Sqrt[1 + ((b*c - a*d)*x^2]/(d*g - c*h)]*Sqrt[1 + ((b*e - a*f)*x^2)/(f*g - e*h)]), x], x, Sqrt[g + h*x]/Sqrt[a + b*x], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x]

Rule 537

```
Int[1/(((a_) + (b_.)*(x_)^2)*Sqrt[(c_) + (d_.)*(x_)^2]*Sqrt[(e_) + (f_.)*(x_)^2]), x_Symbol] :> Simp[(1*EllipticPi[(b*c)/(a*d), ArcSin[Rt[-(d/c), 2]*x], (c*f)/(d*e))]/(a*Sqrt[c]*Sqrt[e]*Rt[-(d/c), 2]), x] /; FreeQ[{a, b, c, d, e, f}, x] && !GtQ[d/c, 0] && GtQ[c, 0] && GtQ[e, 0] && !( !GtQ[f/e, 0] && SimplerSqrtQ[-(f/e), -(d/c)])]
```

Rubi steps

$$\int \frac{\sqrt{7+5x}}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}} dx = \frac{(23\sqrt{2}\sqrt{\frac{2-3x}{7+5x}}\sqrt{\frac{-5+2x}{7+5x}}(7+5x)) \operatorname{Subst}\left(\int \frac{1}{(4-5x^2)\sqrt{1-\frac{31x^2}{11}}\sqrt{1-\frac{39x^2}{22}}} dx, x, \frac{\sqrt{1+4x}}{\sqrt{7+5x}}\right)}{11\sqrt{2-3x}\sqrt{-5+2x}}$$

$$= \frac{23\sqrt{\frac{2-3x}{7+5x}}\sqrt{\frac{5-2x}{7+5x}}(7+5x)\Pi\left(\frac{55}{124}; \sin^{-1}\left(\frac{\sqrt{\frac{31}{11}}\sqrt{1+4x}}{\sqrt{7+5x}}\right) \middle| \frac{39}{62}\right)}{2\sqrt{682}\sqrt{2-3x}\sqrt{-5+2x}}$$

Mathematica [A] time = 0.158327, size = 95, normalized size = 0.95

$$\frac{62\sqrt{4x+1}\sqrt{\frac{5-2x}{5x+7}}\Pi\left(-\frac{55}{69}; \sin^{-1}\left(\frac{\sqrt{\frac{23}{11}}\sqrt{2-3x}}{\sqrt{5x+7}}\right) \middle| -\frac{39}{23}\right)}{3\sqrt{253}\sqrt{2x-5}\sqrt{\frac{4x+1}{5x+7}}}$$

Antiderivative was successfully verified.

[In] Integrate[Sqrt[7 + 5*x]/(Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]),x]

[Out] (-62*Sqrt[1 + 4*x]*Sqrt[(5 - 2*x)/(7 + 5*x)]*EllipticPi[-55/69, ArcSin[(Sqrt[23/11]*Sqrt[2 - 3*x])/Sqrt[7 + 5*x]], -39/23])/(3*Sqrt[253]*Sqrt[-5 + 2*x]*Sqrt[(1 + 4*x)/(7 + 5*x)])

Maple [B] time = 0.021, size = 170, normalized size = 1.7

$$\frac{23\sqrt{13}\sqrt{3}\sqrt{11}}{25740x^3 - 45474x^2 - 71214x + 60060} \left(\operatorname{EllipticF}\left(\frac{\sqrt{31}\sqrt{11}}{31}\sqrt{\frac{7+5x}{4x+1}}, \frac{\sqrt{31}\sqrt{78}}{39}\right) - \operatorname{EllipticPi}\left(\frac{\sqrt{31}\sqrt{11}}{31}\sqrt{\frac{7+5x}{4x+1}}, \frac{12}{55}\right) \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `int((7+5*x)^(1/2)/(2-3*x)^(1/2)/(2*x-5)^(1/2)/(4*x+1)^(1/2),x)`

[Out] `23/858*(EllipticF(1/31*31^(1/2)*11^(1/2)*((7+5*x)/(4*x+1))^(1/2),1/39*31^(1/2)*78^(1/2))-EllipticPi(1/31*31^(1/2)*11^(1/2)*((7+5*x)/(4*x+1))^(1/2),124/55,1/39*31^(1/2)*78^(1/2))*((-2+3*x)/(4*x+1))^(1/2)*((2*x-5)/(4*x+1))^(1/2)*13^(1/2)*3^(1/2)*((7+5*x)/(4*x+1))^(1/2)*11^(1/2)*(4*x+1)^(3/2)*(2*x-5)^(1/2)*(2-3*x)^(1/2)*(7+5*x)^(1/2)/(30*x^3-53*x^2-83*x+70)`

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{5x+7}}{\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((7+5*x)^(1/2)/(2-3*x)^(1/2)/(-5+2*x)^(1/2)/(1+4*x)^(1/2),x, algorithm="maxima")`

[Out] `integrate(sqrt(5*x + 7)/(sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)), x)`

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{5x+7}\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2}}{24x^3-70x^2+21x+10},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((7+5*x)^(1/2)/(2-3*x)^(1/2)/(-5+2*x)^(1/2)/(1+4*x)^(1/2),x, algorithm="fricas")`

[Out] `integral(-sqrt(5*x + 7)*sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)/(24*x^3 - 70*x^2 + 21*x + 10), x)`

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{5x+7}}{\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((7+5*x)**(1/2)/(2-3*x)**(1/2)/(-5+2*x)**(1/2)/(1+4*x)**(1/2),x)

[Out] Integral(sqrt(5*x + 7)/(sqrt(2 - 3*x)*sqrt(2*x - 5)*sqrt(4*x + 1)), x)

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{5x+7}}{\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((7+5*x)^(1/2)/(2-3*x)^(1/2)/(-5+2*x)^(1/2)/(1+4*x)^(1/2),x, algorithm="giac")

[Out] integrate(sqrt(5*x + 7)/(sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)), x)

$$3.104 \quad \int \frac{1}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}\sqrt{7+5x}} dx$$

Optimal. Leaf size=71

$$\frac{2\sqrt{5x+7}\text{EllipticF}\left(\tan^{-1}\left(\frac{\sqrt{4x+1}}{\sqrt{2}\sqrt{2-3x}}\right), -\frac{39}{23}\right)}{\sqrt{253}\sqrt{2x-5}\sqrt{\frac{5x+7}{5-2x}}}$$

[Out] (2*Sqrt[7 + 5*x]*EllipticF[ArcTan[Sqrt[1 + 4*x]/(Sqrt[2]*Sqrt[2 - 3*x])], -39/23])/(Sqrt[253]*Sqrt[-5 + 2*x]*Sqrt[(7 + 5*x)/(5 - 2*x)])

Rubi [A] time = 0.0428364, antiderivative size = 71, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 37, $\frac{\text{number of rules}}{\text{integrand size}} = 0.054$, Rules used = {170, 418}

$$\frac{2\sqrt{5x+7}F\left(\tan^{-1}\left(\frac{\sqrt{4x+1}}{\sqrt{2}\sqrt{2-3x}}\right)\middle| -\frac{39}{23}\right)}{\sqrt{253}\sqrt{2x-5}\sqrt{\frac{5x+7}{5-2x}}}$$

Antiderivative was successfully verified.

[In] Int[1/(Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*Sqrt[7 + 5*x]),x]

[Out] (2*Sqrt[7 + 5*x]*EllipticF[ArcTan[Sqrt[1 + 4*x]/(Sqrt[2]*Sqrt[2 - 3*x])], -39/23])/(Sqrt[253]*Sqrt[-5 + 2*x]*Sqrt[(7 + 5*x)/(5 - 2*x)])

Rule 170

Int[1/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Dist[(2*Sqrt[g + h*x]*Sqrt[(b*e - a*f)*(c + d*x)]/((d*e - c*f)*(a + b*x))]/((f*g - e*h)*Sqrt[c + d*x]*Sqrt[-(((b*e - a*f)*(g + h*x))/((f*g - e*h)*(a + b*x)))]), Subst[Int[1/(Sqrt[1 + ((b*c - a*d)*x^2)/(d*e - c*f)]*Sqrt[1 - ((b*g - a*h)*x^2)/(f*g - e*h]])], x], x, Sqrt[e + f*x]/Sqrt[a + b*x]], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x]

Rule 418

Int[1/(Sqrt[(a_) + (b_.)*(x_)^2]*Sqrt[(c_) + (d_.)*(x_)^2]), x_Symbol] := Simp[(Sqrt[a + b*x^2]*EllipticF[ArcTan[Rt[d/c, 2]*x], 1 - (b*c)/(a*d)])/(a*R

`t[d/c, 2]*Sqrt[c + d*x^2]*Sqrt[(c*(a + b*x^2))/(a*(c + d*x^2))], x] /; FreeQ[{a, b, c, d}, x] && PosQ[d/c] && PosQ[b/a] && !SimplerSqrtQ[b/a, d/c]`

Rubi steps

$$\int \frac{1}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}\sqrt{7+5x}} dx = \frac{\left(\sqrt{\frac{2}{253}}\sqrt{\frac{-5+2x}{2-3x}}\sqrt{7+5x}\right) \text{Subst}\left(\int \frac{1}{\sqrt{1+\frac{x^2}{2}}\sqrt{1+\frac{31x^2}{23}}} dx, x, \frac{\sqrt{1+4x}}{\sqrt{2-3x}}\right)}{\sqrt{-5+2x}\sqrt{\frac{7+5x}{2-3x}}}$$

$$= \frac{2\sqrt{7+5x}F\left(\tan^{-1}\left(\frac{\sqrt{1+4x}}{\sqrt{2}\sqrt{2-3x}}\right) \middle| -\frac{39}{23}\right)}{\sqrt{253}\sqrt{-5+2x}\sqrt{\frac{7+5x}{5-2x}}}$$

Mathematica [A] time = 0.139292, size = 90, normalized size = 1.27

$$\frac{2\sqrt{4x+1}\sqrt{\frac{5-2x}{5x+7}}\text{EllipticF}\left(\sin^{-1}\left(\frac{\sqrt{\frac{23}{11}}\sqrt{2-3x}}{\sqrt{5x+7}}\right), -\frac{39}{23}\right)}{\sqrt{253}\sqrt{2x-5}\sqrt{\frac{4x+1}{5x+7}}}$$

Antiderivative was successfully verified.

[In] Integrate[1/(Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*Sqrt[7 + 5*x]),x]

[Out] (-2*Sqrt[1 + 4*x]*Sqrt[(5 - 2*x)/(7 + 5*x)]*EllipticF[ArcSin[(Sqrt[23/11]*Sqrt[2 - 3*x])/Sqrt[7 + 5*x]], -39/23])/(Sqrt[253]*Sqrt[-5 + 2*x]*Sqrt[(1 + 4*x)/(7 + 5*x)])

Maple [A] time = 0.022, size = 134, normalized size = 1.9

$$\frac{2\sqrt{13}\sqrt{3}\sqrt{11}}{12870x^3 - 22737x^2 - 35607x + 30030}\text{EllipticF}\left(\frac{\sqrt{31}\sqrt{11}}{31}\sqrt{\frac{7+5x}{4x+1}}, \frac{\sqrt{31}\sqrt{78}}{39}\right)\sqrt{\frac{-2+3x}{4x+1}}\sqrt{\frac{2x-5}{4x+1}}\sqrt{\frac{7+5x}{4x+1}}(4x+1)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(1/(7+5*x)^(1/2)/(2-3*x)^(1/2)/(2*x-5)^(1/2)/(4*x+1)^(1/2), x)

[Out] $2/429 * \text{EllipticF}(1/31 * 31^{1/2} * 11^{1/2} * ((7+5*x)/(4*x+1))^{1/2}, 1/39 * 31^{1/2} * 78^{1/2}) * ((-2+3*x)/(4*x+1))^{1/2} * ((2*x-5)/(4*x+1))^{1/2} * 13^{1/2} * 3^{1/2} * ((7+5*x)/(4*x+1))^{1/2} * 11^{1/2} * (4*x+1)^{3/2} * (2*x-5)^{1/2} * (2-3*x)^{1/2} * (7+5*x)^{1/2} / (30*x^3 - 53*x^2 - 83*x + 70)$

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{5x+7}\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate(1/(7+5*x)^(1/2)/(2-3*x)^(1/2)/(-5+2*x)^(1/2)/(1+4*x)^(1/2),x, algorithm="maxima")`

[Out] `integrate(1/(sqrt(5*x + 7)*sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)), x)`

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{5x+7}\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2}}{120x^4 - 182x^3 - 385x^2 + 197x + 70}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate(1/(7+5*x)^(1/2)/(2-3*x)^(1/2)/(-5+2*x)^(1/2)/(1+4*x)^(1/2),x, algorithm="fricas")`

[Out] `integral(-sqrt(5*x + 7)*sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)/(120*x^4 - 182*x^3 - 385*x^2 + 197*x + 70), x)`

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}\sqrt{5x+7}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(7+5*x)**(1/2)/(2-3*x)**(1/2)/(-5+2*x)**(1/2)/(1+4*x)**(1/2),x)

[Out] Integral(1/(sqrt(2 - 3*x)*sqrt(2*x - 5)*sqrt(4*x + 1)*sqrt(5*x + 7)), x)

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{5x+7}\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(7+5*x)^(1/2)/(2-3*x)^(1/2)/(-5+2*x)^(1/2)/(1+4*x)^(1/2),x, algorithm="giac")

[Out] integrate(1/(sqrt(5*x + 7)*sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)), x)

$$3.105 \quad \int \frac{1}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^{3/2}} dx$$

Optimal. Leaf size=195

$$\frac{2\sqrt{\frac{3}{143}}(2-3x)\sqrt{\frac{5-2x}{2-3x}}\sqrt{\frac{4x+1}{2-3x}}\text{EllipticF}\left(\sin^{-1}\left(\frac{\sqrt{\frac{11}{23}}\sqrt{5x+7}}{\sqrt{2-3x}}\right), -\frac{23}{39}\right)}{31\sqrt{2x-5}\sqrt{4x+1}} + \frac{10\sqrt{\frac{11}{39}}\sqrt{2-3x}\sqrt{\frac{5-2x}{5x+7}}E\left(\sin^{-1}\left(\frac{\sqrt{\frac{39}{22}}\sqrt{4x+1}}{\sqrt{5x+7}}\right)\middle|\frac{62}{39}\right)}{713\sqrt{2x-5}\sqrt{\frac{2-3x}{5x+7}}}$$

[Out] (10*Sqrt[11/39]*Sqrt[2 - 3*x]*Sqrt[(5 - 2*x)/(7 + 5*x)]*EllipticE[ArcSin[(Sqrt[39/22]*Sqrt[1 + 4*x])/Sqrt[7 + 5*x]], 62/39])/(713*Sqrt[-5 + 2*x]*Sqrt[(2 - 3*x)/(7 + 5*x)]) + (2*Sqrt[3/143]*(2 - 3*x)*Sqrt[(5 - 2*x)/(2 - 3*x)]*Sqrt[-((1 + 4*x)/(2 - 3*x))]*EllipticF[ArcSin[(Sqrt[11/23]*Sqrt[7 + 5*x])/Sqrt[2 - 3*x]], -23/39])/(31*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])

Rubi [A] time = 0.182889, antiderivative size = 270, normalized size of antiderivative = 1.38, number of steps used = 8, number of rules used = 7, integrand size = 37, $\frac{\text{number of rules}}{\text{integrand size}} = 0.189$, Rules used = {171, 170, 418, 176, 422, 492, 411}

$$\frac{10\sqrt{2x-5}\sqrt{4x+1}}{897\sqrt{2-3x}\sqrt{5x+7}} + \frac{6\sqrt{5x+7}F\left(\tan^{-1}\left(\frac{\sqrt{4x+1}}{\sqrt{2}\sqrt{2-3x}}\right)\middle|\frac{39}{23}\right)}{31\sqrt{253}\sqrt{2x-5}\sqrt{\frac{5x+7}{5-2x}}} - \frac{5\sqrt{\frac{22}{31}}\sqrt{4x+1}F\left(\tan^{-1}\left(\frac{\sqrt{\frac{31}{11}}\sqrt{2x-5}}{\sqrt{5x+7}}\right)\middle|\frac{39}{62}\right)}{1209\sqrt{2-3x}\sqrt{-\frac{4x+1}{2-3x}}} + \frac{10\sqrt{\frac{22}{31}}\sqrt{4x-5}}{897\sqrt{2-3x}\sqrt{5x+7}}$$

Antiderivative was successfully verified.

[In] Int[1/(Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(7 + 5*x)^(3/2)), x]

[Out] (-10*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/(897*Sqrt[2 - 3*x]*Sqrt[7 + 5*x]) + (10*Sqrt[22/31]*Sqrt[1 + 4*x]*EllipticE[ArcTan[(Sqrt[31/11]*Sqrt[-5 + 2*x])/Sqrt[7 + 5*x]], 39/62])/(897*Sqrt[2 - 3*x]*Sqrt[-((1 + 4*x)/(2 - 3*x))]) + (6*Sqrt[7 + 5*x]*EllipticF[ArcTan[Sqrt[1 + 4*x]/(Sqrt[2]*Sqrt[2 - 3*x])], -39/23])/(31*Sqrt[253]*Sqrt[-5 + 2*x]*Sqrt[(7 + 5*x)/(5 - 2*x)]) - (5*Sqrt[22/31]*Sqrt[1 + 4*x]*EllipticF[ArcTan[(Sqrt[31/11]*Sqrt[-5 + 2*x])/Sqrt[7 + 5*x]], 39/62])/(1209*Sqrt[2 - 3*x]*Sqrt[-((1 + 4*x)/(2 - 3*x))])

Rule 171

Int[1/(((a_.) + (b_.)*(x_))^(3/2)*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := -Dist[d/(b*c - a*d), Int[1/(Sqrt[a + b*x]*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]), x], x] + Dist[b

Rule 411

```
Int[Sqrt[(a_) + (b_.)*(x_)^2]/((c_) + (d_.)*(x_)^2)^(3/2), x_Symbol] := Sim
p[(Sqrt[a + b*x^2]*EllipticE[ArcTan[Rt[d/c, 2]*x], 1 - (b*c)/(a*d)])/(c*Rt[
d/c, 2]*Sqrt[c + d*x^2]*Sqrt[(c*(a + b*x^2))/(a*(c + d*x^2))]), x] /; FreeQ
[{a, b, c, d}, x] && PosQ[b/a] && PosQ[d/c]
```

Rubi steps

$$\int \frac{1}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^{3/2}} dx = \frac{3}{31} \int \frac{1}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}\sqrt{7+5x}} dx + \frac{5}{31} \int \frac{\sqrt{2-3x}}{\sqrt{-5+2x}\sqrt{1+4x}}$$

$$= \frac{(5\sqrt{2}\sqrt{2-3x}\sqrt{\frac{1+4x}{7+5x}}) \text{Subst}\left(\int \frac{\sqrt{1+\frac{31x^2}{11}}}{\sqrt{1+\frac{23x^2}{22}}} dx, x, \frac{\sqrt{-5+2x}}{\sqrt{7+5x}}\right) + (3\sqrt{\frac{2}{253}}\sqrt{\frac{-5+2x}{2-3x}})}{1209\sqrt{1+4x}\sqrt{\frac{2-3x}{7+5x}}} + \frac{6\sqrt{7+5x}F\left(\tan^{-1}\left(\frac{\sqrt{1+4x}}{\sqrt{2}\sqrt{2-3x}}\right) \middle| -\frac{39}{23}\right) + (5\sqrt{2}\sqrt{2-3x}\sqrt{\frac{1+4x}{7+5x}}) \text{Subst}\left(\int \frac{\sqrt{1+\frac{31x^2}{11}}}{\sqrt{1+\frac{23x^2}{22}}} dx, x, \frac{\sqrt{-5+2x}}{\sqrt{7+5x}}\right)}{31\sqrt{253}\sqrt{-5+2x}\sqrt{\frac{7+5x}{5-2x}}} + \frac{5\sqrt{\frac{22}{31}}\sqrt{1+4x}}{1209\sqrt{1+4x}}$$

$$= -\frac{10\sqrt{-5+2x}\sqrt{1+4x}}{897\sqrt{2-3x}\sqrt{7+5x}} + \frac{6\sqrt{7+5x}F\left(\tan^{-1}\left(\frac{\sqrt{1+4x}}{\sqrt{2}\sqrt{2-3x}}\right) \middle| -\frac{39}{23}\right) + 5\sqrt{\frac{22}{31}}\sqrt{1+4x}}{31\sqrt{253}\sqrt{-5+2x}\sqrt{\frac{7+5x}{5-2x}}} - \frac{5\sqrt{\frac{22}{31}}\sqrt{1+4x}}{1209\sqrt{1+4x}}$$

$$= -\frac{10\sqrt{-5+2x}\sqrt{1+4x}}{897\sqrt{2-3x}\sqrt{7+5x}} + \frac{10\sqrt{\frac{22}{31}}\sqrt{1+4x}E\left(\tan^{-1}\left(\frac{\sqrt{\frac{31}{11}}\sqrt{-5+2x}}{\sqrt{7+5x}}\right) \middle| \frac{39}{62}\right) + 6\sqrt{7+5x}F\left(\tan^{-1}\left(\frac{\sqrt{1+4x}}{\sqrt{2}\sqrt{2-3x}}\right) \middle| -\frac{39}{23}\right)}{897\sqrt{2-3x}\sqrt{\frac{1+4x}{2-3x}}} + \frac{5\sqrt{\frac{22}{31}}\sqrt{1+4x}}{1209\sqrt{1+4x}}$$

Mathematica [A] time = 1.57502, size = 237, normalized size = 1.22

$$\frac{2\sqrt{2x-5}\sqrt{4x+1} \left(-23\sqrt{682}\sqrt{\frac{8x^2-18x-5}{(2-3x)^2}} (15x^2+11x-14) \text{EllipticF}\left(\sin^{-1}\left(\sqrt{\frac{31}{39}}\sqrt{\frac{2x-5}{3x-2}}\right), \frac{39}{62}\right) + 1705\sqrt{\frac{5x+7}{3x-2}} (8x^2-18x-5) \right)}{305877\sqrt{2-3x}\sqrt{5x+7}\sqrt{\frac{5x+7}{3x-2}} (8x^2-18x-5)}$$

Antiderivative was successfully verified.

[In] Integrate[1/(Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(7 + 5*x)^(3/2)),x]

```
[Out] (-2*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(1705*Sqrt[(7 + 5*x)/(-2 + 3*x)]*(-5 - 18*x + 8*x^2) - 55*Sqrt[682]*Sqrt[(-5 - 18*x + 8*x^2)/(2 - 3*x)^2]*(-14 + 11*x + 15*x^2)*EllipticE[ArcSin[Sqrt[31/39]*Sqrt[(-5 + 2*x)/(-2 + 3*x)]], 39/62] - 23*Sqrt[682]*Sqrt[(-5 - 18*x + 8*x^2)/(2 - 3*x)^2]*(-14 + 11*x + 15*x^2)*EllipticF[ArcSin[Sqrt[31/39]*Sqrt[(-5 + 2*x)/(-2 + 3*x)]], 39/62))/(305877*Sqrt[2 - 3*x]*Sqrt[7 + 5*x]*Sqrt[(7 + 5*x)/(-2 + 3*x)]*(-5 - 18*x + 8*x^2))
```

Maple [B] time = 0.03, size = 599, normalized size = 3.1

$$\frac{2}{36705240x^4 - 55669614x^3 - 117762645x^2 + 60257769x + 21411390} \sqrt{2-3x} \sqrt{2x-5} \sqrt{4x+1} \sqrt{7+5x} \left(1104 \sqrt{11} \sqrt{\frac{7}{4}} \right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(7+5*x)^(3/2)/(2-3*x)^(1/2)/(2*x-5)^(1/2)/(4*x+1)^(1/2), x)
```

```
[Out] 2/305877*(7+5*x)^(1/2)*(2-3*x)^(1/2)*(2*x-5)^(1/2)*(4*x+1)^(1/2)*(1104*11^(1/2)*((7+5*x)/(4*x+1))^(1/2)*3^(1/2)*13^(1/2)*((2*x-5)/(4*x+1))^(1/2)*((-2+3*x)/(4*x+1))^(1/2)*x^2*EllipticF(1/31*31^(1/2)*11^(1/2)*((7+5*x)/(4*x+1))^(1/2), 1/39*31^(1/2)*78^(1/2))+880*11^(1/2)*((7+5*x)/(4*x+1))^(1/2)*3^(1/2)*13^(1/2)*((2*x-5)/(4*x+1))^(1/2)*((-2+3*x)/(4*x+1))^(1/2)*x^2*EllipticE(1/31*31^(1/2)*11^(1/2)*((7+5*x)/(4*x+1))^(1/2), 1/39*31^(1/2)*78^(1/2))+552*11^(1/2)*((7+5*x)/(4*x+1))^(1/2)*3^(1/2)*13^(1/2)*((2*x-5)/(4*x+1))^(1/2)*((-2+3*x)/(4*x+1))^(1/2)*x*EllipticF(1/31*31^(1/2)*11^(1/2)*((7+5*x)/(4*x+1))^(1/2), 1/39*31^(1/2)*78^(1/2))+440*11^(1/2)*((7+5*x)/(4*x+1))^(1/2)*3^(1/2)*13^(1/2)*((2*x-5)/(4*x+1))^(1/2)*((-2+3*x)/(4*x+1))^(1/2)*x*EllipticE(1/31*31^(1/2)*11^(1/2)*((7+5*x)/(4*x+1))^(1/2), 1/39*31^(1/2)*78^(1/2))+69*11^(1/2)*((7+5*x)/(4*x+1))^(1/2)*3^(1/2)*13^(1/2)*((2*x-5)/(4*x+1))^(1/2)*((-2+3*x)/(4*x+1))^(1/2)*EllipticF(1/31*31^(1/2)*11^(1/2)*((7+5*x)/(4*x+1))^(1/2), 1/39*31^(1/2)*78^(1/2))+55*11^(1/2)*((7+5*x)/(4*x+1))^(1/2)*3^(1/2)*13^(1/2)*((2*x-5)/(4*x+1))^(1/2)*((-2+3*x)/(4*x+1))^(1/2)*EllipticE(1/31*31^(1/2)*11^(1/2)*((7+5*x)/(4*x+1))^(1/2), 1/39*31^(1/2)*78^(1/2))+7590*x^2-24035*x+12650)/(120*x^4-182*x^3-385*x^2+197*x+70)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(5x+7)^2 \sqrt{4x+1} \sqrt{2x-5} \sqrt{-3x+2}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(7+5*x)^(3/2)/(2-3*x)^(1/2)/(-5+2*x)^(1/2)/(1+4*x)^(1/2),x, algorithm="maxima")

[Out] integrate(1/((5*x + 7)^(3/2)*sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)), x)

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{5x+7}\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2}}{600x^5-70x^4-3199x^3-1710x^2+1729x+490}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(7+5*x)^(3/2)/(2-3*x)^(1/2)/(-5+2*x)^(1/2)/(1+4*x)^(1/2),x, algorithm="fricas")

[Out] integral(-sqrt(5*x + 7)*sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)/(600*x^5 - 70*x^4 - 3199*x^3 - 1710*x^2 + 1729*x + 490), x)

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(7+5*x)**(3/2)/(2-3*x)**(1/2)/(-5+2*x)**(1/2)/(1+4*x)**(1/2),x)

[Out] Timed out

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(5x+7)^{\frac{3}{2}}\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(7+5*x)^(3/2)/(2-3*x)^(1/2)/(-5+2*x)^(1/2)/(1+4*x)^(1/2),x, alg  
orithm="giac")
```

```
[Out] integrate(1/((5*x + 7)^(3/2)*sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)), x  
)
```

$$3.106 \quad \int \frac{1}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^{5/2}} dx$$

Optimal. Leaf size=288

$$\frac{103964\sqrt{5x+7}\text{EllipticF}\left(\tan^{-1}\left(\frac{\sqrt{4x+1}}{\sqrt{2}\sqrt{2-3x}}\right), -\frac{39}{23}\right)}{1918683\sqrt{253}\sqrt{2x-5}\sqrt{\frac{5x+7}{5-2x}}} + \frac{358120\sqrt{2-3x}\sqrt{4x+1}\sqrt{5x+7}}{2319687747\sqrt{2x-5}} - \frac{895300\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}}{2319687747\sqrt{5x+7}}$$

[Out] (-50*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/(83421*(7 + 5*x)^(3/2)) - (895300*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/(2319687747*Sqrt[7 + 5*x]) + (358120*Sqrt[2 - 3*x]*Sqrt[1 + 4*x]*Sqrt[7 + 5*x])/(2319687747*Sqrt[-5 + 2*x]) - (179060*Sqrt[11/39]*Sqrt[2 - 3*x]*Sqrt[(7 + 5*x)/(5 - 2*x)]*EllipticE[ArcSin[(Sqrt[39/23]*Sqrt[1 + 4*x])/Sqrt[-5 + 2*x]], -23/39])/(59479173*Sqrt[(2 - 3*x)/(5 - 2*x)]*Sqrt[7 + 5*x]) + (103964*Sqrt[7 + 5*x]*EllipticF[ArcTan[Sqrt[1 + 4*x]/(Sqrt[2]*Sqrt[2 - 3*x])], -39/23])/(1918683*Sqrt[253]*Sqrt[-5 + 2*x]*Sqrt[(7 + 5*x)/(5 - 2*x)])

Rubi [A] time = 0.302918, antiderivative size = 288, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 8, integrand size = 37, $\frac{\text{number of rules}}{\text{integrand size}} = 0.216$, Rules used = {172, 1599, 1602, 12, 170, 418, 176, 424}

$$\frac{358120\sqrt{2-3x}\sqrt{4x+1}\sqrt{5x+7}}{2319687747\sqrt{2x-5}} - \frac{895300\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}}{2319687747\sqrt{5x+7}} - \frac{50\sqrt{2-3x}\sqrt{2x-5}\sqrt{4x+1}}{83421(5x+7)^{3/2}} + \frac{103964\sqrt{5x+7}\text{EllipticF}\left(\tan^{-1}\left(\frac{\sqrt{4x+1}}{\sqrt{2}\sqrt{2-3x}}\right), -\frac{39}{23}\right)}{1918683\sqrt{253}\sqrt{2x-5}\sqrt{\frac{5x+7}{5-2x}}}$$

Antiderivative was successfully verified.

[In] Int[1/(Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(7 + 5*x)^(5/2)), x]

[Out] (-50*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/(83421*(7 + 5*x)^(3/2)) - (895300*Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x])/(2319687747*Sqrt[7 + 5*x]) + (358120*Sqrt[2 - 3*x]*Sqrt[1 + 4*x]*Sqrt[7 + 5*x])/(2319687747*Sqrt[-5 + 2*x]) - (179060*Sqrt[11/39]*Sqrt[2 - 3*x]*Sqrt[(7 + 5*x)/(5 - 2*x)]*EllipticE[ArcSin[(Sqrt[39/23]*Sqrt[1 + 4*x])/Sqrt[-5 + 2*x]], -23/39])/(59479173*Sqrt[(2 - 3*x)/(5 - 2*x)]*Sqrt[7 + 5*x]) + (103964*Sqrt[7 + 5*x]*EllipticF[ArcTan[Sqrt[1 + 4*x]/(Sqrt[2]*Sqrt[2 - 3*x])], -39/23])/(1918683*Sqrt[253]*Sqrt[-5 + 2*x]*Sqrt[(7 + 5*x)/(5 - 2*x)])

Rule 172

```

Int[((a_.) + (b_.)*(x_))^(m_)/(Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*
(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Simp[(b^2*(a + b*x)^(m + 1)*S
qrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/((m + 1)*(b*c - a*d)*(b*e - a*f)*
(b*g - a*h)), x] - Dist[1/(2*(m + 1)*(b*c - a*d)*(b*e - a*f)*(b*g - a*h)),
Int[((a + b*x)^(m + 1)/(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]))*Simp[2*
a^2*d*f*h*(m + 1) - 2*a*b*(m + 1)*(d*f*g + d*e*h + c*f*h) + b^2*(2*m + 3)*
(d*e*g + c*f*g + c*e*h) - 2*b*(a*d*f*h*(m + 1) - b*(m + 2)*(d*f*g + d*e*h +
c*f*h))*x + d*f*h*(2*m + 5)*b^2*x^2, x], x], x] /; FreeQ[{a, b, c, d, e, f,
g, h}, x] && IntegerQ[2*m] && LeQ[m, -2]

```

Rule 1599

```

Int((((a_.) + (b_.)*(x_))^(m_)*((A_.) + (B_.)*(x_)))/(Sqrt[(c_.) + (d_.)*(x
_)]*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Simp[(
(A*b^2 - a*b*B)*(a + b*x)^(m + 1)*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]
)/((m + 1)*(b*c - a*d)*(b*e - a*f)*(b*g - a*h)), x] - Dist[1/(2*(m + 1)*(b*
c - a*d)*(b*e - a*f)*(b*g - a*h)), Int[((a + b*x)^(m + 1)/(Sqrt[c + d*x]*Sq
rt[e + f*x]*Sqrt[g + h*x]))*Simp[A*(2*a^2*d*f*h*(m + 1) - 2*a*b*(m + 1)*(d*
f*g + d*e*h + c*f*h) + b^2*(2*m + 3)*(d*e*g + c*f*g + c*e*h)) - b*B*(a*(d*e
*g + c*f*g + c*e*h) + 2*b*c*e*g*(m + 1)) - 2*((A*b - a*B)*(a*d*f*h*(m + 1)
- b*(m + 2)*(d*f*g + d*e*h + c*f*h)))*x + d*f*h*(2*m + 5)*(A*b^2 - a*b*B)*x
^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, g, h, A, B}, x] && IntegerQ[2*m]
&& LtQ[m, -1]

```

Rule 1602

```

Int(((A_.) + (B_.)*(x_) + (C_.)*(x_)^2)/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.
) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbo
l] := Simp[(C*Sqrt[a + b*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(b*f*h*Sqrt[c + d*
x]), x] + (Dist[1/(2*b*d*f*h), Int[(1*Simp[2*A*b*d*f*h - C*(b*d*e*g + a*c*f
*h) + (2*b*B*d*f*h - C*(a*d*f*h + b*(d*f*g + d*e*h + c*f*h)))*x, x])/(Sqrt[
a + b*x]*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]), x], x] + Dist[(C*(d*e
- c*f)*(d*g - c*h))/(2*b*d*f*h), Int[Sqrt[a + b*x]/((c + d*x)^(3/2)*Sqrt[e
+ f*x]*Sqrt[g + h*x]), x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, A, B, C},
x]

```

Rule 12

```

Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_)] /; FreeQ[b, x]

```

Rule 170

```

Int[1/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)
*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Dist[(2*Sqrt[g + h*x]*Sqrt[(

```

```
(b*e - a*f)*(c + d*x)/((d*e - c*f)*(a + b*x))]/((f*g - e*h)*Sqrt[c + d*x]
*Sqrt[-(((b*e - a*f)*(g + h*x))/((f*g - e*h)*(a + b*x))))], Subst[Int[1/(Sqrt[1 + ((b*c - a*d)*x^2)/(d*e - c*f)]*Sqrt[1 - ((b*g - a*h)*x^2)/(f*g - e*h)]]), x], x, Sqrt[e + f*x]/Sqrt[a + b*x]], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x]
```

Rule 418

```
Int[1/(Sqrt[(a_) + (b_.)*(x_)^2]*Sqrt[(c_) + (d_.)*(x_)^2]), x_Symbol] := Simp[(Sqrt[a + b*x^2]*EllipticF[ArcTan[Rt[d/c, 2]*x], 1 - (b*c)/(a*d)])/(a*Rt[d/c, 2]*Sqrt[c + d*x^2]*Sqrt[(c*(a + b*x^2))/(a*(c + d*x^2))]), x] /; FreeQ[{a, b, c, d}, x] && PosQ[d/c] && PosQ[b/a] && !SimplerSqrtQ[b/a, d/c]
```

Rule 176

```
Int[Sqrt[(c_.) + (d_.)*(x_)]/(((a_.) + (b_.)*(x_)^(3/2)*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Dist[(-2*Sqrt[c + d*x]*Sqrt[-(((b*e - a*f)*(g + h*x))/((f*g - e*h)*(a + b*x))))]/((b*e - a*f)*Sqrt[g + h*x]*Sqrt[((b*e - a*f)*(c + d*x))/((d*e - c*f)*(a + b*x))]), Subst[Int[Sqrt[1 + ((b*c - a*d)*x^2)/(d*e - c*f)]/Sqrt[1 - ((b*g - a*h)*x^2)/(f*g - e*h)], x], x, Sqrt[e + f*x]/Sqrt[a + b*x]], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x]
```

Rule 424

```
Int[Sqrt[(a_) + (b_.)*(x_)^2]/Sqrt[(c_) + (d_.)*(x_)^2], x_Symbol] := Simp[(Sqrt[a]*EllipticE[ArcSin[Rt[-(d/c), 2]*x], (b*c)/(a*d)])/(Sqrt[c]*Rt[-(d/c), 2]), x] /; FreeQ[{a, b, c, d}, x] && NegQ[d/c] && GtQ[c, 0] && GtQ[a, 0]
```

Rubi steps

$$\begin{aligned}
\int \frac{1}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^{5/2}} dx &= -\frac{50\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{83421(7+5x)^{3/2}} + \frac{\int \frac{11928-4270x}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^{3/2}} dx}{83421} \\
&= -\frac{50\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{83421(7+5x)^{3/2}} - \frac{895300\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{2319687747\sqrt{7+5x}} + \frac{\int \frac{4}{\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}(7+5x)^{3/2}} dx}{2319687747} \\
&= -\frac{50\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{83421(7+5x)^{3/2}} - \frac{895300\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{2319687747\sqrt{7+5x}} + \frac{358}{2319687747} \\
&= -\frac{50\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{83421(7+5x)^{3/2}} - \frac{895300\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{2319687747\sqrt{7+5x}} + \frac{358}{2319687747} \\
&= -\frac{50\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{83421(7+5x)^{3/2}} - \frac{895300\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{2319687747\sqrt{7+5x}} + \frac{358}{2319687747} \\
&= -\frac{50\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{83421(7+5x)^{3/2}} - \frac{895300\sqrt{2-3x}\sqrt{-5+2x}\sqrt{1+4x}}{2319687747\sqrt{7+5x}} + \frac{358}{2319687747}
\end{aligned}$$

Mathematica [A] time = 1.71931, size = 246, normalized size = 0.85

$$\frac{2\sqrt{2x-5}\sqrt{4x+1} \left(-28819\sqrt{682}(3x-2)\sqrt{\frac{8x^2-18x-5}{(2-3x)^2}}(5x+7)^2 \text{EllipticF} \left(\sin^{-1} \left(\sqrt{\frac{31}{39}} \sqrt{\frac{2x-5}{3x-2}} \right), \frac{39}{62} \right) + 1705\sqrt{\frac{5x+7}{3x-2}} (608600 \right)}{25516565217\sqrt{2-3x}(5x+7)^{3/2}}$$

Antiderivative was successfully verified.

[In] Integrate[1/(Sqrt[2 - 3*x]*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(7 + 5*x)^(5/2)), x]

[Out] (-2*Sqrt[-5 + 2*x]*Sqrt[1 + 4*x]*(1705*Sqrt[(7 + 5*x)/(-2 + 3*x)]*(-671560 - 2797991*x - 294854*x^2 + 608600*x^3) - 984830*Sqrt[682]*(-2 + 3*x)*(7 + 5*x)^2*Sqrt[(-5 - 18*x + 8*x^2)/(2 - 3*x)^2]*EllipticE[ArcSin[Sqrt[31/39]*Sqrt[(-5 + 2*x)/(-2 + 3*x)]]], 39/62] - 28819*Sqrt[682]*(-2 + 3*x)*(7 + 5*x)^2*Sqrt[(-5 - 18*x + 8*x^2)/(2 - 3*x)^2]*EllipticF[ArcSin[Sqrt[31/39]*Sqrt[(-5 + 2*x)/(-2 + 3*x)]]], 39/62))/(25516565217*Sqrt[2 - 3*x]*(7 + 5*x)^(3/2)*

$\text{Sqrt}[(7 + 5*x)/(-2 + 3*x)]*(-5 - 18*x + 8*x^2)$

Maple [B] time = 0.031, size = 786, normalized size = 2.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] $\text{int}(1/(7+5*x)^{(5/2)}/(2-3*x)^{(1/2)}/(2*x-5)^{(1/2)}/(4*x+1)^{(1/2)}, x)$

[Out] $2/25516565217*(50128960*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}*3^{(1/2)}*13^{(1/2)}*((2*x-5)/(4*x+1))^{(1/2)}*((-2+3*x)/(4*x+1))^{(1/2)}*\text{EllipticF}(1/31*31^{(1/2)}*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}, 1/39*31^{(1/2)}*78^{(1/2)})*x^3+78786400*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}*3^{(1/2)}*13^{(1/2)}*((2*x-5)/(4*x+1))^{(1/2)}*((-2+3*x)/(4*x+1))^{(1/2)}*\text{EllipticE}(1/31*31^{(1/2)}*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}, 1/39*31^{(1/2)}*78^{(1/2)})*x^3+95245024*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}*3^{(1/2)}*13^{(1/2)}*((2*x-5)/(4*x+1))^{(1/2)}*((-2+3*x)/(4*x+1))^{(1/2)}*x^2*\text{EllipticF}(1/31*31^{(1/2)}*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}, 1/39*31^{(1/2)}*78^{(1/2)})+149694160*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}*3^{(1/2)}*13^{(1/2)}*((2*x-5)/(4*x+1))^{(1/2)}*((-2+3*x)/(4*x+1))^{(1/2)}*x^2*\text{EllipticE}(1/31*31^{(1/2)}*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}, 1/39*31^{(1/2)}*78^{(1/2)})+38223332*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}*3^{(1/2)}*13^{(1/2)}*((2*x-5)/(4*x+1))^{(1/2)}*((-2+3*x)/(4*x+1))^{(1/2)}*x*\text{EllipticF}(1/31*31^{(1/2)}*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}, 1/39*31^{(1/2)}*78^{(1/2)})+60074630*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}*3^{(1/2)}*13^{(1/2)}*((2*x-5)/(4*x+1))^{(1/2)}*((-2+3*x)/(4*x+1))^{(1/2)}*x*\text{EllipticE}(1/31*31^{(1/2)}*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}, 1/39*31^{(1/2)}*78^{(1/2)})+4386284*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}*3^{(1/2)}*13^{(1/2)}*((2*x-5)/(4*x+1))^{(1/2)}*((-2+3*x)/(4*x+1))^{(1/2)}*\text{EllipticF}(1/31*31^{(1/2)}*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}, 1/39*31^{(1/2)}*78^{(1/2)})+6893810*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}*3^{(1/2)}*13^{(1/2)}*((2*x-5)/(4*x+1))^{(1/2)}*((-2+3*x)/(4*x+1))^{(1/2)}*\text{EllipticE}(1/31*31^{(1/2)}*11^{(1/2)}*((7+5*x)/(4*x+1))^{(1/2)}, 1/39*31^{(1/2)}*78^{(1/2)})+496006500*x^3-665223020*x^2-2040625895*x+1509107050)*(4*x+1)^{(1/2)}*(2*x-5)^{(1/2)}*(2-3*x)^{(1/2)}/(120*x^4-182*x^3-385*x^2+197*x+70)/(7+5*x)^{(1/2)}$

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(5x+7)^2 \sqrt{4x+1} \sqrt{2x-5} \sqrt{-3x+2}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(7+5*x)^(5/2)/(2-3*x)^(1/2)/(-5+2*x)^(1/2)/(1+4*x)^(1/2),x, algorithm="maxima")

[Out] integrate(1/((5*x + 7)^(5/2)*sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)), x)

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{5x+7}\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2}}{3000x^6+3850x^5-16485x^4-30943x^3-3325x^2+14553x+3430}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(7+5*x)^(5/2)/(2-3*x)^(1/2)/(-5+2*x)^(1/2)/(1+4*x)^(1/2),x, algorithm="fricas")

[Out] integral(-sqrt(5*x + 7)*sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)/(3000*x^6 + 3850*x^5 - 16485*x^4 - 30943*x^3 - 3325*x^2 + 14553*x + 3430), x)

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(7+5*x)**(5/2)/(2-3*x)**(1/2)/(-5+2*x)**(1/2)/(1+4*x)**(1/2),x)

[Out] Timed out

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(5x+7)^{\frac{5}{2}}\sqrt{4x+1}\sqrt{2x-5}\sqrt{-3x+2}} dx$$

Verification of antiderivative is not currently implemented for this CAS.


```
[In] integrate(1/(7+5*x)^(5/2)/(2-3*x)^(1/2)/(-5+2*x)^(1/2)/(1+4*x)^(1/2),x, alg  
orithm="giac")
```

```
[Out] integrate(1/((5*x + 7)^(5/2)*sqrt(4*x + 1)*sqrt(2*x - 5)*sqrt(-3*x + 2)), x  
)
```

$$3.107 \quad \int \frac{(a+bx)^{3/2}}{\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}} dx$$

Optimal. Leaf size=968

$$\frac{\sqrt{dg-ch}\sqrt{fg-eh}\sqrt{a+bx}\sqrt{\frac{(de-cf)(g+hx)}{(dg-ch)(e+fx)}}E\left(\sin^{-1}\left(\frac{\sqrt{fg-eh}\sqrt{c+dx}}{\sqrt{dg-ch}\sqrt{e+fx}}\right)\middle|\frac{(be-af)(dg-ch)}{(bc-ad)(fg-eh)}\right)b}{dfh\sqrt{-\frac{(de-cf)(a+bx)}{(bc-ad)(e+fx)}}\sqrt{g+hx}} + \frac{(de-cf)(bfg+beh-2afh)\sqrt{\frac{(be-af)(g+hx)}{(de-cf)(g+hx)}}}{df^2h\sqrt{bg-ah}}$$

[Out] (b*Sqrt[a + b*x]*Sqrt[c + d*x]*Sqrt[g + h*x])/(d*h*Sqrt[e + f*x]) - (b*Sqrt[d*g - c*h]*Sqrt[f*g - e*h]*Sqrt[a + b*x]*Sqrt[((d*e - c*f)*(g + h*x))/((d*g - c*h)*(e + f*x))])*EllipticE[ArcSin[(Sqrt[f*g - e*h]*Sqrt[c + d*x])/(Sqrt[d*g - c*h]*Sqrt[e + f*x])], ((b*e - a*f)*(d*g - c*h))/((b*c - a*d)*(f*g - e*h)))]/(d*f*h*Sqrt[-(((d*e - c*f)*(a + b*x))/((b*c - a*d)*(e + f*x)))]*Sqrt[g + h*x]) + (b*(d*e - c*f)*(b*f*g + b*e*h - 2*a*f*h)*Sqrt[((b*e - a*f)*(c + d*x))/((d*e - c*f)*(a + b*x))])*Sqrt[g + h*x]*EllipticF[ArcSin[(Sqrt[b*g - a*h]*Sqrt[e + f*x])/(Sqrt[f*g - e*h]*Sqrt[a + b*x])], -(((b*c - a*d)*(f*g - e*h))/((d*e - c*f)*(b*g - a*h)))]/(d*f^2*h*Sqrt[b*g - a*h]*Sqrt[f*g - e*h]*Sqrt[c + d*x]*Sqrt[-(((b*e - a*f)*(g + h*x))/((f*g - e*h)*(a + b*x)))]]) + (b*Sqrt[b*g - a*h]*(a*d*f*h - b*(d*f*g + d*e*h - c*f*h))*Sqrt[((f*g - e*h)*(a + b*x))/((b*g - a*h)*(e + f*x))])*Sqrt[((f*g - e*h)*(c + d*x))/((d*g - c*h)*(e + f*x))]*(e + f*x)*EllipticPi[(f*(b*g - a*h))/((b*e - a*f)*h), ArcSin[(Sqrt[b*e - a*f]*Sqrt[g + h*x])/(Sqrt[b*g - a*h]*Sqrt[e + f*x])], ((d*e - c*f)*(b*g - a*h))/((b*e - a*f)*(d*g - c*h)))]/(d*f^2*Sqrt[b*e - a*f]*h^2*Sqrt[a + b*x]*Sqrt[c + d*x]) - (2*Sqrt[b*c - a*d]*Sqrt[-(d*g) + c*h]*(a + b*x)*Sqrt[((b*g - a*h)*(c + d*x))/((d*g - c*h)*(a + b*x))])*Sqrt[((b*g - a*h)*(e + f*x))/((f*g - e*h)*(a + b*x))])*EllipticPi[-((b*(d*g - c*h))/((b*c - a*d)*h)), ArcSin[(Sqrt[b*c - a*d]*Sqrt[g + h*x])/(Sqrt[-(d*g) + c*h]*Sqrt[a + b*x])], ((b*e - a*f)*(d*g - c*h))/((b*c - a*d)*(f*g - e*h)))]/(d*h*Sqrt[c + d*x]*Sqrt[e + f*x])

Rubi [A] time = 0.882066, antiderivative size = 968, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 8, integrand size = 37, $\frac{\text{number of rules}}{\text{integrand size}} = 0.216$, Rules used = {166, 173, 176, 424, 170, 419, 165, 537}

$$\frac{\sqrt{dg-ch}\sqrt{fg-eh}\sqrt{a+bx}\sqrt{\frac{(de-cf)(g+hx)}{(dg-ch)(e+fx)}}E\left(\sin^{-1}\left(\frac{\sqrt{fg-eh}\sqrt{c+dx}}{\sqrt{dg-ch}\sqrt{e+fx}}\right)\middle|\frac{(be-af)(dg-ch)}{(bc-ad)(fg-eh)}\right)b}{dfh\sqrt{-\frac{(de-cf)(a+bx)}{(bc-ad)(e+fx)}}\sqrt{g+hx}} + \frac{(de-cf)(bfg+beh-2afh)\sqrt{\frac{(be-af)(g+hx)}{(de-cf)(g+hx)}}}{df^2h\sqrt{bg-ah}}$$

Antiderivative was successfully verified.

[In] Int[(a + b*x)^(3/2)/(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]),x]

[Out] (b*Sqrt[a + b*x]*Sqrt[c + d*x]*Sqrt[g + h*x])/(d*h*Sqrt[e + f*x]) - (b*Sqrt[d*g - c*h]*Sqrt[f*g - e*h]*Sqrt[a + b*x]*Sqrt[((d*e - c*f)*(g + h*x))/((d*g - c*h)*(e + f*x))])*EllipticE[ArcSin[(Sqrt[f*g - e*h]*Sqrt[c + d*x])/(Sqrt[d*g - c*h]*Sqrt[e + f*x])], ((b*e - a*f)*(d*g - c*h))/((b*c - a*d)*(f*g - e*h)))]/(d*f*h*Sqrt[-((d*e - c*f)*(a + b*x))/((b*c - a*d)*(e + f*x))])*Sqrt[g + h*x] + (b*(d*e - c*f)*(b*f*g + b*e*h - 2*a*f*h)*Sqrt[((b*e - a*f)*(c + d*x))/((d*e - c*f)*(a + b*x))])*Sqrt[g + h*x]*EllipticF[ArcSin[(Sqrt[b*g - a*h]*Sqrt[e + f*x])/(Sqrt[f*g - e*h]*Sqrt[a + b*x])], -((b*c - a*d)*(f*g - e*h))/((d*e - c*f)*(b*g - a*h)))]/(d*f^2*h*Sqrt[b*g - a*h]*Sqrt[f*g - e*h]*Sqrt[c + d*x]*Sqrt[-((b*e - a*f)*(g + h*x))/((f*g - e*h)*(a + b*x))]) + (b*Sqrt[b*g - a*h]*(a*d*f*h - b*(d*f*g + d*e*h - c*f*h))*Sqrt[((f*g - e*h)*(a + b*x))/((b*g - a*h)*(e + f*x))])*Sqrt[((f*g - e*h)*(c + d*x))/((d*g - c*h)*(e + f*x))]*(e + f*x)*EllipticPi[(f*(b*g - a*h))/((b*e - a*f)*h), ArcSin[(Sqrt[b*e - a*f]*Sqrt[g + h*x])/(Sqrt[b*g - a*h]*Sqrt[e + f*x])], ((d*e - c*f)*(b*g - a*h))/((b*e - a*f)*(d*g - c*h)))]/(d*f^2*Sqrt[b*e - a*f]*h^2*Sqrt[a + b*x]*Sqrt[c + d*x]) - (2*Sqrt[b*c - a*d]*Sqrt[-(d*g) + c*h]*(a + b*x)*Sqrt[((b*g - a*h)*(c + d*x))/((d*g - c*h)*(a + b*x))])*Sqrt[((b*g - a*h)*(e + f*x))/((f*g - e*h)*(a + b*x))])*EllipticPi[-((b*(d*g - c*h))/((b*c - a*d)*h)), ArcSin[(Sqrt[b*c - a*d]*Sqrt[g + h*x])/(Sqrt[-(d*g) + c*h]*Sqrt[a + b*x])], ((b*e - a*f)*(d*g - c*h))/((b*c - a*d)*(f*g - e*h)))]/(d*h*Sqrt[c + d*x]*Sqrt[e + f*x])

Rule 166

Int[((a_.) + (b_.)*(x_))^(3/2)/(Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Dist[b/d, Int[(Sqrt[a + b*x]*Sqrt[c + d*x])/(Sqrt[e + f*x]*Sqrt[g + h*x]), x], x] - Dist[(b*c - a*d)/d, Int[Sqrt[a + b*x]/(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]), x], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x]

Rule 173

Int[(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)])/(Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Simp[(Sqrt[a + b*x]*Sqrt[c + d*x]*Sqrt[g + h*x])/(h*Sqrt[e + f*x]), x] + (-Dist[((d*e - c*f)*(f*g - e*h))/(2*f*h), Int[Sqrt[a + b*x]/(Sqrt[c + d*x]*(e + f*x)^(3/2)*Sqrt[g + h*x]), x], x] + Dist[((d*e - c*f)*(b*f*g + b*e*h - 2*a*f*h))/(2*f^2*h), Int[1/(Sqrt[a + b*x]*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]), x], x] + Dist[(a*d*f*h - b*(d*f*g + d*e*h - c*f*h))/(2*f^2*h), Int[Sqrt[e + f*x]/(Sqrt[a + b*x]*Sqrt[c + d*x]*Sqrt[g + h*x]), x], x]) /; FreeQ[{a, b, c, d, e, f, g, h}, x]

Rule 176

```
Int[Sqrt[(c_.) + (d_.)*(x_)]/(((a_.) + (b_.)*(x_))^(3/2)*Sqrt[(e_.) + (f_.)
*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Dist[(-2*Sqrt[c + d*x]*Sqrt[
-(((b*e - a*f)*(g + h*x))/((f*g - e*h)*(a + b*x))))]/((b*e - a*f)*Sqrt[g +
h*x]*Sqrt[((b*e - a*f)*(c + d*x))/((d*e - c*f)*(a + b*x))]), Subst[Int[Sqrt
[1 + ((b*c - a*d)*x^2)/(d*e - c*f)]/Sqrt[1 - ((b*g - a*h)*x^2)/(f*g - e*h)]
, x], x, Sqrt[e + f*x]/Sqrt[a + b*x]], x] /; FreeQ[{a, b, c, d, e, f, g, h}
, x]
```

Rule 424

```
Int[Sqrt[(a_) + (b_.)*(x_)^2]/Sqrt[(c_) + (d_.)*(x_)^2], x_Symbol] := Simp[
(Sqrt[a]*EllipticE[ArcSin[Rt[-(d/c), 2]*x], (b*c)/(a*d)]/(Sqrt[c]*Rt[-(d/c
), 2])), x] /; FreeQ[{a, b, c, d}, x] && NegQ[d/c] && GtQ[c, 0] && GtQ[a, 0]
```

Rule 170

```
Int[1/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)
*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Dist[(2*Sqrt[g + h*x]*Sqrt[(
(b*e - a*f)*(c + d*x))/((d*e - c*f)*(a + b*x))])/((f*g - e*h)*Sqrt[c + d*x]
*Sqrt[-(((b*e - a*f)*(g + h*x))/((f*g - e*h)*(a + b*x))))], Subst[Int[1/(Sqr
t[1 + ((b*c - a*d)*x^2)/(d*e - c*f)]*Sqrt[1 - ((b*g - a*h)*x^2)/(f*g - e*h
)]), x], x, Sqrt[e + f*x]/Sqrt[a + b*x]], x] /; FreeQ[{a, b, c, d, e, f, g,
h}, x]
```

Rule 419

```
Int[1/(Sqrt[(a_) + (b_.)*(x_)^2]*Sqrt[(c_) + (d_.)*(x_)^2]), x_Symbol] := S
imp[(1*EllipticF[ArcSin[Rt[-(d/c), 2]*x], (b*c)/(a*d)]/(Sqrt[a]*Sqrt[c]*Rt
[-(d/c), 2])), x] /; FreeQ[{a, b, c, d}, x] && NegQ[d/c] && GtQ[c, 0] && GtQ
[a, 0] && !(NegQ[b/a] && SimplerSqrtQ[-(b/a), -(d/c)])
```

Rule 165

```
Int[Sqrt[(a_.) + (b_.)*(x_)]/(Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(
x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] := Dist[(2*(a + b*x)*Sqrt[((b*g -
a*h)*(c + d*x))/((d*g - c*h)*(a + b*x))]*Sqrt[((b*g - a*h)*(e + f*x))/((f*
g - e*h)*(a + b*x))])/((Sqrt[c + d*x]*Sqrt[e + f*x])], Subst[Int[1/((h - b*x^
2)*Sqrt[1 + ((b*c - a*d)*x^2)/(d*g - c*h)]*Sqrt[1 + ((b*e - a*f)*x^2)/(f*g
- e*h)]), x], x, Sqrt[g + h*x]/Sqrt[a + b*x]], x] /; FreeQ[{a, b, c, d, e,
f, g, h}, x]
```

Rule 537

```
Int[1/(((a_) + (b_.)*(x_)^2)*Sqrt[(c_) + (d_.)*(x_)^2]*Sqrt[(e_) + (f_.)*(x_)^2]), x_Symbol] :> Simp[(1*EllipticPi[(b*c)/(a*d), ArcSin[Rt[-(d/c), 2]*x], (c*f)/(d*e))]/(a*Sqrt[c]*Sqrt[e]*Rt[-(d/c), 2]), x] /; FreeQ[{a, b, c, d, e, f}, x] && !GtQ[d/c, 0] && GtQ[c, 0] && GtQ[e, 0] && !( !GtQ[f/e, 0] && SimplerSqrtQ[-(f/e), -(d/c)])
```

Rubi steps

$$\begin{aligned} \int \frac{(a+bx)^{3/2}}{\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}} dx &= \frac{b \int \frac{\sqrt{a+bx}\sqrt{c+dx}}{\sqrt{e+fx}\sqrt{g+hx}} dx}{d} - \frac{(bc-ad) \int \frac{\sqrt{a+bx}}{\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}} dx}{d} \\ &= \frac{b\sqrt{a+bx}\sqrt{c+dx}\sqrt{g+hx}}{dh\sqrt{e+fx}} - \frac{(b(de-cf)(fg-eh)) \int \frac{\sqrt{a+bx}}{\sqrt{c+dx}(e+fx)^{3/2}\sqrt{g+hx}} dx}{2dfh} + \frac{(b(de-cf)(fg-eh)) \int \frac{\sqrt{a+bx}}{\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}} dx}{2dfh} \\ &= \frac{b\sqrt{a+bx}\sqrt{c+dx}\sqrt{g+hx}}{dh\sqrt{e+fx}} - \frac{2\sqrt{bc-ad}\sqrt{-dg+ch}(a+bx) \sqrt{\frac{(bg-ah)(c+dx)}{(dg-ch)(a+bx)}} \sqrt{\frac{(bg-ah)(e+fx)}{(fg-ch)(a+bx)}}}{dh\sqrt{c+dx}} \\ &= \frac{b\sqrt{a+bx}\sqrt{c+dx}\sqrt{g+hx}}{dh\sqrt{e+fx}} - \frac{b\sqrt{dg-ch}\sqrt{fg-eh}\sqrt{a+bx} \sqrt{\frac{(de-cf)(g+hx)}{(dg-ch)(e+fx)}} E\left(\sin^{-1}\left(\frac{\sqrt{fg}}{\sqrt{dg}}\right)\right)}{dfh \sqrt{\frac{(de-cf)(a+bx)}{(bc-ad)(e+fx)}} \sqrt{g+hx}} \end{aligned}$$

Mathematica [B] time = 14.2736, size = 6638, normalized size = 6.86

Result too large to show

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*x)^(3/2)/(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]),x]
```

```
[Out] Result too large to show
```

Maple [B] time = 0.087, size = 16526, normalized size = 17.1

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x+a)^(3/2)/(d*x+c)^(1/2)/(f*x+e)^(1/2)/(h*x+g)^(1/2),x)
```

```
[Out] result too large to display
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bx+a)^{\frac{3}{2}}}{\sqrt{dx+c}\sqrt{fx+e}\sqrt{hx+g}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^(3/2)/(d*x+c)^(1/2)/(f*x+e)^(1/2)/(h*x+g)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate((b*x + a)^(3/2)/(sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)), x)
```

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^(3/2)/(d*x+c)^(1/2)/(f*x+e)^(1/2)/(h*x+g)^(1/2),x, algorithm="fricas")
```

```
[Out] Timed out
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)**(3/2)/(d*x+c)**(1/2)/(f*x+e)**(1/2)/(h*x+g)**(1/2),x)
```

[Out] Timed out

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bx + a)^{\frac{3}{2}}}{\sqrt{dx + c}\sqrt{fx + e}\sqrt{hx + g}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b*x+a)^(3/2)/(d*x+c)^(1/2)/(f*x+e)^(1/2)/(h*x+g)^(1/2),x, algorithm="giac")

[Out] integrate((b*x + a)^(3/2)/(sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)), x)

$$3.108 \quad \int \frac{\sqrt{a+bx}}{\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}} dx$$

Optimal. Leaf size=228

$$\frac{2(a+bx)\sqrt{ch-dg}\sqrt{\frac{(c+dx)(bg-ah)}{(a+bx)(dg-ch)}}\sqrt{\frac{(e+fx)(bg-ah)}{(a+bx)(fg-eh)}}\Pi\left(-\frac{b(dg-ch)}{(bc-ad)h}; \sin^{-1}\left(\frac{\sqrt{bc-ad}\sqrt{g+hx}}{\sqrt{ch-dg}\sqrt{a+bx}}\right)\right)\frac{(be-af)(dg-ch)}{(bc-ad)(fg-eh)}}{h\sqrt{c+dx}\sqrt{e+fx}\sqrt{bc-ad}}$$

[Out] (2*Sqrt[-(d*g) + c*h]*(a + b*x)*Sqrt[((b*g - a*h)*(c + d*x))/((d*g - c*h)*(a + b*x))])*Sqrt[((b*g - a*h)*(e + f*x))/((f*g - e*h)*(a + b*x))]*EllipticPi[-((b*(d*g - c*h))/((b*c - a*d)*h)), ArcSin[(Sqrt[b*c - a*d]*Sqrt[g + h*x])/(Sqrt[-(d*g) + c*h]*Sqrt[a + b*x])], ((b*e - a*f)*(d*g - c*h))/((b*c - a*d)*(f*g - e*h)))/(Sqrt[b*c - a*d]*h*Sqrt[c + d*x]*Sqrt[e + f*x])

Rubi [A] time = 0.149761, antiderivative size = 228, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 37, $\frac{\text{number of rules}}{\text{integrand size}} = 0.054$, Rules used = {165, 537}

$$\frac{2(a+bx)\sqrt{ch-dg}\sqrt{\frac{(c+dx)(bg-ah)}{(a+bx)(dg-ch)}}\sqrt{\frac{(e+fx)(bg-ah)}{(a+bx)(fg-eh)}}\Pi\left(-\frac{b(dg-ch)}{(bc-ad)h}; \sin^{-1}\left(\frac{\sqrt{bc-ad}\sqrt{g+hx}}{\sqrt{ch-dg}\sqrt{a+bx}}\right)\right)\frac{(be-af)(dg-ch)}{(bc-ad)(fg-eh)}}{h\sqrt{c+dx}\sqrt{e+fx}\sqrt{bc-ad}}$$

Antiderivative was successfully verified.

[In] Int[Sqrt[a + b*x]/(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]), x]

[Out] (2*Sqrt[-(d*g) + c*h]*(a + b*x)*Sqrt[((b*g - a*h)*(c + d*x))/((d*g - c*h)*(a + b*x))])*Sqrt[((b*g - a*h)*(e + f*x))/((f*g - e*h)*(a + b*x))]*EllipticPi[-((b*(d*g - c*h))/((b*c - a*d)*h)), ArcSin[(Sqrt[b*c - a*d]*Sqrt[g + h*x])/(Sqrt[-(d*g) + c*h]*Sqrt[a + b*x])], ((b*e - a*f)*(d*g - c*h))/((b*c - a*d)*(f*g - e*h)))/(Sqrt[b*c - a*d]*h*Sqrt[c + d*x]*Sqrt[e + f*x])

Rule 165

Int[Sqrt[(a_.) + (b_.)*(x_)]/(Sqrt[(c_.) + (d_.)*(x_)]*Sqrt[(e_.) + (f_.)*(x_)]*Sqrt[(g_.) + (h_.)*(x_)]), x_Symbol] :> Dist[(2*(a + b*x)*Sqrt[((b*g - a*h)*(c + d*x))/((d*g - c*h)*(a + b*x))])*Sqrt[((b*g - a*h)*(e + f*x))/((f*g - e*h)*(a + b*x)))/(Sqrt[c + d*x]*Sqrt[e + f*x]), Subst[Int[1/((h - b*x^2)*Sqrt[1 + ((b*c - a*d)*x^2]/(d*g - c*h)]*Sqrt[1 + ((b*e - a*f)*x^2)/(f*g - e*h)]), x], x, Sqrt[g + h*x]/Sqrt[a + b*x]], x] /; FreeQ[{a, b, c, d, e,

f, g, h}, x]

Rule 537

Int[1/(((a_) + (b_)*(x_)^2)*Sqrt[(c_) + (d_)*(x_)^2]*Sqrt[(e_) + (f_)*(x_)^2]), x_Symbol] :> Simp[(1*EllipticPi[(b*c)/(a*d), ArcSin[Rt[-(d/c), 2]*x], (c*f)/(d*e)])/((a*Sqrt[c]*Sqrt[e]*Rt[-(d/c), 2]), x] /; FreeQ[{a, b, c, d, e, f}, x] && !GtQ[d/c, 0] && GtQ[c, 0] && GtQ[e, 0] && !(!GtQ[f/e, 0] && SimplerSqrtQ[-(f/e), -(d/c)])]

Rubi steps

$$\int \frac{\sqrt{a+bx}}{\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}} dx = \frac{\left(2(a+bx)\sqrt{\frac{(bg-ah)(c+dx)}{(dg-ch)(a+bx)}}\sqrt{\frac{(bg-ah)(e+fx)}{(fg-eh)(a+bx)}}\right) \text{Subst} \left[\int \frac{1}{(h-bx^2)\sqrt{1+\frac{(bc-ad)x^2}{dg-ch}}\sqrt{1+\frac{(be-af)x^2}{fg-eh}}} dx, x, \frac{a+bx}{\sqrt{c+dx}\sqrt{e+fx}} \right]}{\sqrt{c+dx}\sqrt{e+fx}}$$

$$= \frac{2\sqrt{-dg+ch}(a+bx)\sqrt{\frac{(bg-ah)(c+dx)}{(dg-ch)(a+bx)}}\sqrt{\frac{(bg-ah)(e+fx)}{(fg-eh)(a+bx)}}\Pi\left(-\frac{b(dg-ch)}{(bc-ad)h}; \sin^{-1}\left(\frac{\sqrt{bc-ad}\sqrt{g+hx}}{\sqrt{-dg+ch}\sqrt{a+bx}}\right)\right)}{\sqrt{bc-adh}\sqrt{c+dx}\sqrt{e+fx}}$$

Mathematica [B] time = 5.57101, size = 584, normalized size = 2.56

$$\frac{2(c+dx)^{3/2}\sqrt{\frac{(a+bx)(dg-ch)}{(c+dx)(bg-ah)}}\left(\frac{ad(g+hx)\sqrt{\frac{(e+fx)(dg-ch)}{(c+dx)(fg-eh)}}\text{EllipticF}\left(\sin^{-1}\left(\sqrt{\frac{(g+hx)(cf-de)}{(c+dx)(fg-eh)}}\right), \frac{(bc-ad)(eh-fg)}{(bg-ah)(de-cf)}\right)}{(c+dx)(dg-ch)\sqrt{\frac{(g+hx)(cf-de)}{(c+dx)(fg-eh)}}}\right) + \frac{bc(g+hx)\sqrt{\frac{(e+fx)(dg-ch)}{(c+dx)(fg-eh)}}\text{EllipticF}\left(\sin^{-1}\left(\sqrt{\frac{(g+hx)(cf-de)}{(c+dx)(fg-eh)}}\right), \frac{(bc-ad)(eh-fg)}{(bg-ah)(de-cf)}\right)}{(c+dx)(ch-dg)\sqrt{\frac{(g+hx)(cf-de)}{(c+dx)(fg-eh)}}}}{d\sqrt{a+bx}\sqrt{e+fx}\sqrt{g+hx}}$$

Antiderivative was successfully verified.

[In] Integrate[Sqrt[a + b*x]/(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]),x]

[Out] (-2*Sqrt[((d*g - c*h)*(a + b*x))/((b*g - a*h)*(c + d*x))]*(c + d*x)^(3/2)*((a*d*Sqrt[((d*g - c*h)*(e + f*x))/((f*g - e*h)*(c + d*x))]*(g + h*x)*EllipticF[ArcSin[Sqrt[((-d*e) + c*f)*(g + h*x))/((f*g - e*h)*(c + d*x))]], ((b*c - a*d)*(-f*g) + e*h)/((d*e - c*f)*(b*g - a*h)))/((d*g - c*h)*(c + d*x)*Sqrt[((-d*e) + c*f)*(g + h*x))/((f*g - e*h)*(c + d*x)) + (b*c*Sqrt[((d*g - c*h)*(e + f*x))/((f*g - e*h)*(c + d*x))]*(g + h*x)*EllipticF[ArcSin[Sqrt[((-d*e) + c*f)*(g + h*x))/((f*g - e*h)*(c + d*x))]], ((b*c - a*d)*(-f*g) + e*h)/((d*e - c*f)*(b*g - a*h)))/((-d*g) + c*h)*(c + d*x)*Sqrt[((-d*e) + c*f)*(g + h*x))/((f*g - e*h)*(c + d*x)) + (b*(f*g - e*h)*Sqrt[-((d*e

$(f-b*e)^{(1/2)} * x * b^2 * e * f^2 * g^2 + \text{EllipticF}(((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^{(1/2)}, ((c*f-d*e)*(a*h-b*g)/(c*h-d*g)/(a*f-b*e))^{(1/2)}) * a^2 * e^2 * f * h^2 - \text{EllipticF}(((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^{(1/2)}, ((c*f-d*e)*(a*h-b*g)/(c*h-d*g)/(a*f-b*e))^{(1/2)}) * a * b * e^3 * h^2 - \text{EllipticF}(((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^{(1/2)}, ((c*f-d*e)*(a*h-b*g)/(c*h-d*g)/(a*f-b*e))^{(1/2)}) * a * b * e^2 * f * g * h + \text{EllipticF}(((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^{(1/2)}, ((c*f-d*e)*(a*h-b*g)/(c*h-d*g)/(a*f-b*e))^{(1/2)}) * b^2 * e^3 * g * h + \text{EllipticPi}(((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^{(1/2)}, (a*h-b*g)*f/h/(a*f-b*e), ((c*f-d*e)*(a*h-b*g)/(c*h-d*g)/(a*f-b*e))^{(1/2)}) * a * b * e^3 * h^2 - \text{EllipticPi}(((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^{(1/2)}, (a*h-b*g)*f/h/(a*f-b*e), ((c*f-d*e)*(a*h-b*g)/(c*h-d*g)/(a*f-b*e))^{(1/2)}) * a * b * e^2 * f * g * h - \text{EllipticPi}(((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^{(1/2)}, (a*h-b*g)*f/h/(a*f-b*e), ((c*f-d*e)*(a*h-b*g)/(c*h-d*g)/(a*f-b*e))^{(1/2)}) * b^2 * e^3 * g * h + \text{EllipticPi}(((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^{(1/2)}, (a*h-b*g)*f/h/(a*f-b*e), ((c*f-d*e)*(a*h-b*g)/(c*h-d*g)/(a*f-b*e))^{(1/2)}) * b^2 * e^2 * f * g^2 * ((e*h-f*g)*(b*x+a)/(a*h-b*g)/(f*x+e))^{(1/2)} * ((e*h-f*g)*(d*x+c)/(c*h-d*g)/(f*x+e))^{(1/2)} * ((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^{(1/2)} / h / f / (h*x+g)^{(1/2)} / (f*x+e)^{(1/2)} / (d*x+c)^{(1/2)} / (b*x+a)^{(1/2)} / (e*h-f*g) / (a*f-b*e)$

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{bx+a}}{\sqrt{dx+c}\sqrt{fx+e}\sqrt{hx+g}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b*x+a)^(1/2)/(d*x+c)^(1/2)/(f*x+e)^(1/2)/(h*x+g)^(1/2),x, algorithm="maxima")

[Out] integrate(sqrt(b*x + a)/(sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)), x)

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b*x+a)^(1/2)/(d*x+c)^(1/2)/(f*x+e)^(1/2)/(h*x+g)^(1/2),x, algorithm="fricas")

[Out] Timed out

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{a+bx}}{\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b*x+a)**(1/2)/(d*x+c)**(1/2)/(f*x+e)**(1/2)/(h*x+g)**(1/2),x)

[Out] Integral(sqrt(a + b*x)/(sqrt(c + d*x)*sqrt(e + f*x)*sqrt(g + h*x)), x)

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{bx+a}}{\sqrt{dx+c}\sqrt{fx+e}\sqrt{hx+g}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b*x+a)^(1/2)/(d*x+c)^(1/2)/(f*x+e)^(1/2)/(h*x+g)^(1/2),x, algorithm="giac")

[Out] integrate(sqrt(b*x + a)/(sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)), x)

$$3.109 \quad \int \frac{1}{\sqrt{a+bx}\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}} dx$$

Optimal. Leaf size=161

$$\frac{2\sqrt{e+fx}\sqrt{\frac{(c+dx)(fg-eh)}{(e+fx)(dg-ch)}} \text{EllipticF}\left(\tan^{-1}\left(\frac{\sqrt{g+hx}\sqrt{be-af}}{\sqrt{a+bx}\sqrt{fg-eh}}\right), \frac{(bg-ah)(de-cf)}{(be-af)(dg-ch)}\right)}{\sqrt{c+dx}\sqrt{be-af}\sqrt{fg-eh}}$$

[Out] (-2*Sqrt[((f*g - e*h)*(c + d*x))/((d*g - c*h)*(e + f*x))]*Sqrt[e + f*x]*EllipticF[ArcTan[(Sqrt[b*e - a*f]*Sqrt[g + h*x])/(Sqrt[f*g - e*h]*Sqrt[a + b*x])]], ((d*e - c*f)*(b*g - a*h))/((b*e - a*f)*(d*g - c*h))]/(Sqrt[b*e - a*f]*Sqrt[f*g - e*h]*Sqrt[c + d*x])

Rubi [A] time = 0.0820603, antiderivative size = 198, normalized size of antiderivative = 1.23, number of steps used = 2, number of rules used = 2, integrand size = 37, $\frac{\text{number of rules}}{\text{integrand size}} = 0.054$, Rules used = {170, 419}

$$\frac{2\sqrt{g+hx}\sqrt{\frac{(c+dx)(be-af)}{(a+bx)(de-cf)}} F\left(\sin^{-1}\left(\frac{\sqrt{bg-ah}\sqrt{e+fx}}{\sqrt{fg-eh}\sqrt{a+bx}}\right) \middle| -\frac{(bc-ad)(fg-eh)}{(de-cf)(bg-ah)}\right)}{\sqrt{c+dx}\sqrt{bg-ah}\sqrt{fg-eh}\sqrt{-\frac{(g+hx)(be-af)}{(a+bx)(fg-eh)}}}$$

Antiderivative was successfully verified.

[In] Int[1/(Sqrt[a + b*x]*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]), x]

[Out] (2*Sqrt[((b*e - a*f)*(c + d*x))/((d*e - c*f)*(a + b*x))]*Sqrt[g + h*x]*EllipticF[ArcSin[(Sqrt[b*g - a*h]*Sqrt[e + f*x])/(Sqrt[f*g - e*h]*Sqrt[a + b*x])]], -(((b*c - a*d)*(f*g - e*h))/((d*e - c*f)*(b*g - a*h))))/(Sqrt[b*g - a*h]*Sqrt[f*g - e*h]*Sqrt[c + d*x]*Sqrt[-(((b*e - a*f)*(g + h*x))/((f*g - e*h)*(a + b*x)))]])

Rule 170

Int[1/(Sqrt[(a_.) + (b_.)*(x_.)]*Sqrt[(c_.) + (d_.)*(x_.)]*Sqrt[(e_.) + (f_.)*(x_.)]*Sqrt[(g_.) + (h_.)*(x_.)]), x_Symbol] := Dist[(2*Sqrt[g + h*x]*Sqrt[(b*e - a*f)*(c + d*x))/((d*e - c*f)*(a + b*x))]/((f*g - e*h)*Sqrt[c + d*x]*Sqrt[-(((b*e - a*f)*(g + h*x))/((f*g - e*h)*(a + b*x)))]), Subst[Int[1/(Sqrt[1 + ((b*c - a*d)*x^2)/(d*e - c*f)]*Sqrt[1 - ((b*g - a*h)*x^2)/(f*g - e*h])], x], x, Sqrt[e + f*x]/Sqrt[a + b*x], x] /; FreeQ[{a, b, c, d, e, f, g,

h}, x]

Rule 419

```
Int[1/(Sqrt[(a_) + (b_)*(x_)^2]*Sqrt[(c_) + (d_)*(x_)^2]), x_Symbol] :> S
imp[(1*EllipticF[ArcSin[Rt[-(d/c), 2]*x], (b*c)/(a*d)]/(Sqrt[a]*Sqrt[c]*Rt
[-(d/c), 2]), x] /; FreeQ[{a, b, c, d}, x] && NegQ[d/c] && GtQ[c, 0] && GtQ
[a, 0] && !(NegQ[b/a] && SimplerSqrtQ[-(b/a), -(d/c)])
```

Rubi steps

$$\int \frac{1}{\sqrt{a+bx}\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}} dx = \frac{\left(2\sqrt{\frac{(be-af)(c+dx)}{(de-cf)(a+bx)}}\sqrt{g+hx}\right) \text{Subst}\left(\int \frac{1}{\sqrt{1+\frac{(bc-ad)x^2}{de-cf}}\sqrt{1-\frac{(bg-ah)x^2}{fg-eh}}} dx, x, \frac{\sqrt{e+fx}}{\sqrt{a+bx}}\right)}{(fg-eh)\sqrt{c+dx}\sqrt{-\frac{(be-af)(g+hx)}{(fg-eh)(a+bx)}}}$$

$$= \frac{2\sqrt{\frac{(be-af)(c+dx)}{(de-cf)(a+bx)}}\sqrt{g+hx}F\left(\sin^{-1}\left(\frac{\sqrt{bg-ah}\sqrt{e+fx}}{\sqrt{fg-eh}\sqrt{a+bx}}\right)\right) - \frac{(bc-ad)(fg-eh)}{(de-cf)(bg-ah)}}{\sqrt{bg-ah}\sqrt{fg-eh}\sqrt{c+dx}\sqrt{-\frac{(be-af)(g+hx)}{(fg-eh)(a+bx)}}}$$

Mathematica [A] time = 1.2895, size = 227, normalized size = 1.41

$$\frac{2\sqrt{a+bx}\sqrt{g+hx}\sqrt{\frac{(c+dx)(bg-ah)}{(a+bx)(dg-ch)}}\sqrt{\frac{(e+fx)(bg-ah)}{(a+bx)(fg-eh)}}\text{EllipticF}\left(\sin^{-1}\left(\sqrt{\frac{(g+hx)(af-be)}{(a+bx)(fg-eh)}}\right), \frac{(ad-bc)(eh-fg)}{(be-af)(dg-ch)}\right)}{\sqrt{c+dx}\sqrt{e+fx}(bg-ah)\sqrt{\frac{(g+hx)(af-be)}{(a+bx)(fg-eh)}}}$$

Antiderivative was successfully verified.

[In] Integrate[1/(Sqrt[a + b*x]*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]), x]

[Out] (-2*Sqrt[a + b*x]*Sqrt[((b*g - a*h)*(c + d*x))/((d*g - c*h)*(a + b*x))]*Sqr
t[((b*g - a*h)*(e + f*x))/((f*g - e*h)*(a + b*x))]*Sqrt[g + h*x]*EllipticF[
ArcSin[Sqrt[((-(b*e) + a*f)*(g + h*x))/((f*g - e*h)*(a + b*x))]], ((-(b*c)
+ a*d)*(-(f*g) + e*h))/((b*e - a*f)*(d*g - c*h))]/((b*g - a*h)*Sqrt[c + d*
x]*Sqrt[e + f*x]*Sqrt[((-(b*e) + a*f)*(g + h*x))/((f*g - e*h)*(a + b*x))])

Maple [A] time = 0.059, size = 270, normalized size = 1.7

$$2 \frac{af^2hx^2 - bf^2gx^2 + 2aefhx - 2befgx + ae^2h - be^2g}{\sqrt{hx+g}\sqrt{fx+e}\sqrt{dx+c}\sqrt{bx+a}} \sqrt{\frac{(af-be)(hx+g)}{(ah-bg)(fx+e)}} \sqrt{\frac{(eh-fg)(dx+c)}{(ch-dg)(fx+e)}} \sqrt{\frac{(eh-fg)(bx+a)}{(ah-bg)(fx+e)}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(1/(b*x+a)^(1/2)/(d*x+c)^(1/2)/(f*x+e)^(1/2)/(h*x+g)^(1/2), x)

[Out] 2/(h*x+g)^(1/2)/(f*x+e)^(1/2)/(d*x+c)^(1/2)/(b*x+a)^(1/2)*((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^(1/2)*((e*h-f*g)*(d*x+c)/(c*h-d*g)/(f*x+e))^(1/2)*((e*h-f*g)*(b*x+a)/(a*h-b*g)/(f*x+e))^(1/2)*EllipticF(((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^(1/2), ((c*f-d*e)*(a*h-b*g)/(c*h-d*g)/(a*f-b*e))^(1/2))*(a*f^2*h*x^2-b*f^2*g*x^2+2*a*e*f*h*x-2*b*e*f*g*x+a*e^2*h-b*e^2*g)/(e*h-f*g)/(a*f-b*e)

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{bx+a}\sqrt{dx+c}\sqrt{fx+e}\sqrt{hx+g}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(b*x+a)^(1/2)/(d*x+c)^(1/2)/(f*x+e)^(1/2)/(h*x+g)^(1/2), x, algorithm="maxima")

[Out] integrate(1/(sqrt(b*x + a)*sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)), x)

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral} \left(\frac{\sqrt{bx+a}\sqrt{dx+c}\sqrt{fx+e}\sqrt{hx+g}}{bdfhx^4 + aceg + (bdfg + (bde + (bc + ad)f)h)x^3 + ((bde + (bc + ad)f)g + (acf + (bc + ad)e)h)x^2 + (aceh + \dots)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(b*x+a)^(1/2)/(d*x+c)^(1/2)/(f*x+e)^(1/2)/(h*x+g)^(1/2), x, algorithm="fricas")

```
[Out] integral(sqrt(b*x + a)*sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)/(b*d*f*h*x
^4 + a*c*e*g + (b*d*f*g + (b*d*e + (b*c + a*d)*f)*h)*x^3 + ((b*d*e + (b*c +
a*d)*f)*g + (a*c*f + (b*c + a*d)*e)*h)*x^2 + (a*c*e*h + (a*c*f + (b*c + a*
d)*e)*g)*x), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{a + bx}\sqrt{c + dx}\sqrt{e + fx}\sqrt{g + hx}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*x+a)**(1/2)/(d*x+c)**(1/2)/(f*x+e)**(1/2)/(h*x+g)**(1/2),x)
```

```
[Out] Integral(1/(sqrt(a + b*x)*sqrt(c + d*x)*sqrt(e + f*x)*sqrt(g + h*x)), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{bx + a}\sqrt{dx + c}\sqrt{fx + e}\sqrt{hx + g}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*x+a)^(1/2)/(d*x+c)^(1/2)/(f*x+e)^(1/2)/(h*x+g)^(1/2),x, algo
rithm="giac")
```

```
[Out] integrate(1/(sqrt(b*x + a)*sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)), x)
```


$$3.110 \quad \int \frac{1}{(a+bx)^{3/2} \sqrt{c+dx} \sqrt{e+fx} \sqrt{g+hx}} dx$$

Optimal. Leaf size=429

$$\frac{2d\sqrt{g+hx} \sqrt{\frac{(c+dx)(be-af)}{(a+bx)(de-cf)}} \operatorname{EllipticF}\left(\sin^{-1}\left(\frac{\sqrt{e+fx}\sqrt{bg-ah}}{\sqrt{a+bx}\sqrt{fg-eh}}\right), -\frac{(bc-ad)(fg-eh)}{(bg-ah)(de-cf)}\right) - 2b\sqrt{c+dx} \sqrt{fg-eh} \sqrt{-\frac{(g+hx)(be-af)}{(a+bx)(fg-eh)}} E\left(\sin^{-1}\left(\frac{\sqrt{bg-ah}}{\sqrt{fg-eh}}\right), -\frac{(bc-ad)(fg-eh)}{(bg-ah)(de-cf)}\right)}{\sqrt{c+dx}(bc-ad)\sqrt{bg-ah}\sqrt{fg-eh} \sqrt{-\frac{(g+hx)(be-af)}{(a+bx)(fg-eh)}} - \sqrt{g+hx}(bc-ad)(be-af)\sqrt{bg-ah}}$$

[Out] $(-2*b*\sqrt{f*g - e*h}*\sqrt{c + d*x}*\sqrt{-(((b*e - a*f)*(g + h*x))/((f*g - e*h)*(a + b*x))))*\operatorname{EllipticE}[\operatorname{ArcSin}[(\sqrt{b*g - a*h}*\sqrt{e + f*x})/(\sqrt{f*g - e*h}*\sqrt{a + b*x})]], -(((b*c - a*d)*(f*g - e*h))/((d*e - c*f)*(b*g - a*h)))))/((b*c - a*d)*(b*e - a*f)*\sqrt{b*g - a*h}*\sqrt{((b*e - a*f)*(c + d*x))/((d*e - c*f)*(a + b*x))}*\sqrt{g + h*x}) - (2*d*\sqrt{((b*e - a*f)*(c + d*x))/((d*e - c*f)*(a + b*x))}*\sqrt{g + h*x}*\operatorname{EllipticF}[\operatorname{ArcSin}[(\sqrt{b*g - a*h}*\sqrt{e + f*x})/(\sqrt{f*g - e*h}*\sqrt{a + b*x})]], -(((b*c - a*d)*(f*g - e*h))/((d*e - c*f)*(b*g - a*h)))))/((b*c - a*d)*\sqrt{b*g - a*h}*\sqrt{f*g - e*h}*\sqrt{c + d*x}*\sqrt{-(((b*e - a*f)*(g + h*x))/((f*g - e*h)*(a + b*x))))}$

Rubi [A] time = 0.256346, antiderivative size = 429, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 37, $\frac{\text{number of rules}}{\text{integrand size}} = 0.135$, Rules used = {171, 170, 419, 176, 424}

$$\frac{2d\sqrt{g+hx} \sqrt{\frac{(c+dx)(be-af)}{(a+bx)(de-cf)}} F\left(\sin^{-1}\left(\frac{\sqrt{bg-ah}\sqrt{e+fx}}{\sqrt{fg-eh}\sqrt{a+bx}}\right) \middle| -\frac{(bc-ad)(fg-eh)}{(de-cf)(bg-ah)}\right) - 2b\sqrt{c+dx} \sqrt{fg-eh} \sqrt{-\frac{(g+hx)(be-af)}{(a+bx)(fg-eh)}} E\left(\sin^{-1}\left(\frac{\sqrt{bg-ah}}{\sqrt{fg-eh}}\right), -\frac{(bc-ad)(fg-eh)}{(de-cf)(bg-ah)}\right)}{\sqrt{c+dx}(bc-ad)\sqrt{bg-ah}\sqrt{fg-eh} \sqrt{-\frac{(g+hx)(be-af)}{(a+bx)(fg-eh)}} - \sqrt{g+hx}(bc-ad)(be-af)\sqrt{bg-ah}}$$

Antiderivative was successfully verified.

[In] $\operatorname{Int}[1/((a + b*x)^{(3/2)}*\sqrt{c + d*x}*\sqrt{e + f*x}*\sqrt{g + h*x}), x]$

[Out] $(-2*b*\sqrt{f*g - e*h}*\sqrt{c + d*x}*\sqrt{-(((b*e - a*f)*(g + h*x))/((f*g - e*h)*(a + b*x))))*\operatorname{EllipticE}[\operatorname{ArcSin}[(\sqrt{b*g - a*h}*\sqrt{e + f*x})/(\sqrt{f*g - e*h}*\sqrt{a + b*x})]], -(((b*c - a*d)*(f*g - e*h))/((d*e - c*f)*(b*g - a*h)))))/((b*c - a*d)*(b*e - a*f)*\sqrt{b*g - a*h}*\sqrt{((b*e - a*f)*(c + d*x))/((d*e - c*f)*(a + b*x))}*\sqrt{g + h*x}) - (2*d*\sqrt{((b*e - a*f)*(c + d*x))/((d*e - c*f)*(a + b*x))}*\sqrt{g + h*x}*\operatorname{EllipticF}[\operatorname{ArcSin}[(\sqrt{b*g - a*h}*\sqrt{e + f*x})/(\sqrt{f*g - e*h}*\sqrt{a + b*x})]], -(((b*c - a*d)*(f*g - e*h))/((d*e - c*f)*(b*g - a*h)))))/((b*c - a*d)*\sqrt{b*g - a*h}*\sqrt{f*g - e*h}*\sqrt{c + d*x}*\sqrt{-(((b*e - a*f)*(g + h*x))/((f*g - e*h)*(a + b*x))))}$

$h] * \text{Sqrt}[c + d*x] * \text{Sqrt}[-(((b*e - a*f)*(g + h*x))/((f*g - e*h)*(a + b*x)))]$

Rule 171

$\text{Int}[1/(((a_.) + (b_.)*(x_))^{3/2} * \text{Sqrt}[(c_.) + (d_.)*(x_)] * \text{Sqrt}[(e_.) + (f_.)*(x_)] * \text{Sqrt}[(g_.) + (h_.)*(x_)]), x_Symbol] \rightarrow -\text{Dist}[d/(b*c - a*d), \text{Int}[1/(\text{Sqrt}[a + b*x] * \text{Sqrt}[c + d*x] * \text{Sqrt}[e + f*x] * \text{Sqrt}[g + h*x]), x], x] + \text{Dist}[b/(b*c - a*d), \text{Int}[\text{Sqrt}[c + d*x]/((a + b*x)^{3/2} * \text{Sqrt}[e + f*x] * \text{Sqrt}[g + h*x]), x], x] /;$ $\text{FreeQ}\{a, b, c, d, e, f, g, h\}, x$

Rule 170

$\text{Int}[1/(\text{Sqrt}[(a_.) + (b_.)*(x_)] * \text{Sqrt}[(c_.) + (d_.)*(x_)] * \text{Sqrt}[(e_.) + (f_.)*(x_)] * \text{Sqrt}[(g_.) + (h_.)*(x_)]), x_Symbol] \rightarrow \text{Dist}[(2 * \text{Sqrt}[g + h*x] * \text{Sqrt}[(b*e - a*f)*(c + d*x)/((d*e - c*f)*(a + b*x))])/((f*g - e*h) * \text{Sqrt}[c + d*x] * \text{Sqrt}[-(((b*e - a*f)*(g + h*x))/((f*g - e*h)*(a + b*x)))]), \text{Subst}[\text{Int}[1/(\text{Sqrt}[1 + ((b*c - a*d)*x^2]/(d*e - c*f)] * \text{Sqrt}[1 - ((b*g - a*h)*x^2)/(f*g - e*h)]), x], x, \text{Sqrt}[e + f*x]/\text{Sqrt}[a + b*x]], x] /;$ $\text{FreeQ}\{a, b, c, d, e, f, g, h\}, x$

Rule 419

$\text{Int}[1/(\text{Sqrt}[(a_) + (b_.)*(x_)^2] * \text{Sqrt}[(c_) + (d_.)*(x_)^2]), x_Symbol] \rightarrow \text{Simp}[(1 * \text{EllipticF}[\text{ArcSin}[\text{Rt}[-(d/c), 2]*x], (b*c)/(a*d)]/(\text{Sqrt}[a] * \text{Sqrt}[c] * \text{Rt}[-(d/c), 2]), x] /;$ $\text{FreeQ}\{a, b, c, d\}, x$ && $\text{NegQ}[d/c]$ && $\text{GtQ}[c, 0]$ && $\text{GtQ}[a, 0]$ && $!(\text{NegQ}[b/a] \&\& \text{SimplerSqrtQ}[-(b/a), -(d/c)])$

Rule 176

$\text{Int}[\text{Sqrt}[(c_.) + (d_.)*(x_)]/(((a_.) + (b_.)*(x_))^{3/2} * \text{Sqrt}[(e_.) + (f_.)*(x_)] * \text{Sqrt}[(g_.) + (h_.)*(x_)]), x_Symbol] \rightarrow \text{Dist}[(-2 * \text{Sqrt}[c + d*x] * \text{Sqrt}[-(((b*e - a*f)*(g + h*x))/((f*g - e*h)*(a + b*x)))])/((b*e - a*f) * \text{Sqrt}[g + h*x] * \text{Sqrt}[(b*e - a*f)*(c + d*x)/((d*e - c*f)*(a + b*x))]), \text{Subst}[\text{Int}[\text{Sqrt}[1 + ((b*c - a*d)*x^2]/(d*e - c*f)]/\text{Sqrt}[1 - ((b*g - a*h)*x^2)/(f*g - e*h)], x], x, \text{Sqrt}[e + f*x]/\text{Sqrt}[a + b*x]], x] /;$ $\text{FreeQ}\{a, b, c, d, e, f, g, h\}, x$

Rule 424

$\text{Int}[\text{Sqrt}[(a_) + (b_.)*(x_)^2]/\text{Sqrt}[(c_) + (d_.)*(x_)^2], x_Symbol] \rightarrow \text{Simp}[(\text{Sqrt}[a] * \text{EllipticE}[\text{ArcSin}[\text{Rt}[-(d/c), 2]*x], (b*c)/(a*d)]/(\text{Sqrt}[c] * \text{Rt}[-(d/c), 2]), x] /;$ $\text{FreeQ}\{a, b, c, d\}, x$ && $\text{NegQ}[d/c]$ && $\text{GtQ}[c, 0]$ && $\text{GtQ}[a, 0]$

Rubi steps

$$\begin{aligned}
\int \frac{1}{(a+bx)^{3/2}\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}} dx &= \frac{b \int \frac{\sqrt{c+dx}}{(a+bx)^{3/2}\sqrt{e+fx}\sqrt{g+hx}} dx}{bc-ad} - \frac{d \int \frac{1}{\sqrt{a+bx}\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}} dx}{bc-ad} \\
&= \frac{\left(2d\sqrt{\frac{(be-af)(c+dx)}{(de-cf)(a+bx)}}\sqrt{g+hx}\right) \text{Subst}\left(\int \frac{1}{\sqrt{1+\frac{(bc-ad)x^2}{de-cf}}\sqrt{1-\frac{(bg-ah)x^2}{fg-eh}}} dx, x, \frac{\sqrt{e+fx}}{\sqrt{a+bx}}\right)}{(bc-ad)(fg-eh)\sqrt{c+dx}\sqrt{\frac{(be-af)(g+hx)}{(fg-eh)(a+bx)}}} \\
&= \frac{2b\sqrt{fg-eh}\sqrt{c+dx}\sqrt{\frac{(be-af)(g+hx)}{(fg-eh)(a+bx)}} E\left(\sin^{-1}\left(\frac{\sqrt{bg-ah}\sqrt{e+fx}}{\sqrt{fg-eh}\sqrt{a+bx}}\right)\right) - \frac{(bc-ad)(fg-eh)}{(de-cf)(bg-ah)}}{(bc-ad)(be-af)\sqrt{bg-ah}\sqrt{\frac{(be-af)(c+dx)}{(de-cf)(a+bx)}}\sqrt{g+hx}}
\end{aligned}$$

Mathematica [B] time = 14.3374, size = 3247, normalized size = 7.57

Result too large to show

Antiderivative was successfully verified.

[In] Integrate[1/((a + b*x)^(3/2)*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]),x]

[Out]
$$\begin{aligned}
&(-2*b^2*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/((b*c - a*d)*(b*e - a*f) \\
&* (b*g - a*h)*Sqrt[a + b*x]) - (2*(-((b*(c + d*x)^(3/2)*(f + (d*e)/(c + d*x) \\
&- (c*f)/(c + d*x))*(h + (d*g)/(c + d*x) - (c*h)/(c + d*x))*Sqrt[a + ((c + \\
&d*x)*(b - (b*c)/(c + d*x))]/d))/(Sqrt[e + ((c + d*x)*(f - (c*f)/(c + d*x)) \\
&/d]*Sqrt[g + ((c + d*x)*(h - (c*h)/(c + d*x))]/d)) + ((b*c - a*d)*f*(b*g - \\
&a*h)*(-(d*g) + c*h)*Sqrt[c + d*x]*Sqrt[(b - (b*c)/(c + d*x) + (a*d)/(c + d \\
&x))*(f + (d*e)/(c + d*x) - (c*f)/(c + d*x))*(h + (d*g)/(c + d*x) - (c*h)/(\\
&c + d*x))]*Sqrt[a + ((c + d*x)*(b - (b*c)/(c + d*x))]/d)*((d*e*Sqrt[-((b*c \\
&- a*d)*(-(d*g) + c*h)*(-b/(b*c - a*d)) + (c + d*x)^(-1)))/(-(b*d*g) + a*d \\
&*h)))*(-(f/(-(d*e) + c*f)) + (c + d*x)^(-1))*Sqrt[(-h/(-(d*g) + c*h)) + (c \\
&+ d*x)^(-1))/(f/(-(d*e) + c*f) - h/(-(d*g) + c*h))]*(((b*d*g) + a*d*h)*E \\
&llipticE[ArcSin[Sqrt[((d*e - c*f)*(h + (d*g)/(c + d*x) - (c*h)/(c + d*x)))/ \\
&(d*(-f*g) + e*h))], ((b*c - a*d)*(-(f*g) + e*h))/((-d*e) + c*f)*(-(b*g) \\
&+ a*h)))/((b*c - a*d)*(-(d*g) + c*h)) - (b*EllipticF[ArcSin[Sqrt[((d*e - c \\
&*f)*(h + (d*g)/(c + d*x) - (c*h)/(c + d*x))]/(d*(-f*g) + e*h))], ((b*c - \\
&a*d)*(-(f*g) + e*h))/((-d*e) + c*f)*(-(b*g) + a*h)))/(b*c - a*d))/(Sqrt[\\
&- (f/(-(d*e) + c*f)) + (c + d*x)^(-1)]/(-(f/(-(d*e) + c*f)) + h/(-(d*g) + c \\
&*h))]*Sqrt[(b + (-b*c) + a*d)/(c + d*x))*(f + (d*e - c*f)/(c + d*x))*(h + \\
&(d*g - c*h)/(c + d*x))] - (c*f*Sqrt[-((b*c - a*d)*(-(d*g) + c*h)*(-b/(b*
\end{aligned}$$

$$\begin{aligned}
& c - a*d)) + (c + d*x)^{-1})/(-b*d*g) + a*d*h)]*(-f/(-d*e) + c*f)) + (c \\
& + d*x)^{-1})*Sqrt[(-h/(-d*g) + c*h)) + (c + d*x)^{-1})/(f/(-d*e) + c*f) \\
& - h/(-d*g) + c*h))] * (((-b*d*g) + a*d*h)*EllipticE[ArcSin[Sqrt[((d*e - c*f) \\
& f)*(h + (d*g)/(c + d*x) - (c*h)/(c + d*x)))/(d*(-f*g) + e*h)]]], ((b*c - a \\
& *d)*(-f*g) + e*h))/((-d*e) + c*f)*(-b*g) + a*h)))/((b*c - a*d)*(-d*g) \\
& + c*h)) - (b*EllipticF[ArcSin[Sqrt[((d*e - c*f)*(h + (d*g)/(c + d*x) - (c*h) \\
&)/(c + d*x)))/(d*(-f*g) + e*h)]]], ((b*c - a*d)*(-f*g) + e*h))/((-d*e) + \\
& c*f)*(-b*g) + a*h)))/(b*c - a*d))/((Sqrt[(-f/(-d*e) + c*f)) + (c + d*x \\
&)^{-1})/(-f/(-d*e) + c*f)) + h/(-d*g) + c*h))] * Sqrt[(b + (-b*c) + a*d)/ \\
& (c + d*x))*(f + (d*e - c*f)/(c + d*x))*(h + (d*g - c*h)/(c + d*x))] + (f*S \\
& qrt[(-b/(b*c - a*d)) + (c + d*x)^{-1})/(-b/(b*c - a*d)) + h/(-d*g) + c*h \\
&)]) * Sqrt[(-f/(-d*e) + c*f)) + (c + d*x)^{-1})/(-f/(-d*e) + c*f)) + h/(- \\
& (d*g) + c*h))] * (-h/(-d*g) + c*h)) + (c + d*x)^{-1}) * EllipticF[ArcSin[Sqrt \\
& [((-d*e) + c*f)*(-h - (d*g)/(c + d*x) + (c*h)/(c + d*x)))/(d*(-f*g) + e*h \\
&)]]], ((b*c - a*d)*(-f*g) + e*h))/((-d*e) + c*f)*(-b*g) + a*h)))/((Sqrt[\\
& (-h/(-d*g) + c*h)) + (c + d*x)^{-1})/(f/(-d*e) + c*f) - h/(-d*g) + c*h) \\
&)]) * Sqrt[(b + (-b*c) + a*d)/(c + d*x))*(f + (d*e - c*f)/(c + d*x))*(h + (d* \\
& g - c*h)/(c + d*x)))]/((f*g - e*h)*(b - (b*c)/(c + d*x) + (a*d)/(c + d*x) \\
&) * Sqrt[e + ((c + d*x)*(f - (c*f)/(c + d*x)))/d] * Sqrt[g + ((c + d*x)*(h - (c \\
& *h)/(c + d*x)))/d]) - ((b*c - a*d)*(b*e - a*f)*(-d*e) + c*f)*h * Sqrt[c + d* \\
& x] * Sqrt[(b - (b*c)/(c + d*x) + (a*d)/(c + d*x))*(f + (d*e)/(c + d*x) - (c*f) \\
&)/(c + d*x))*(h + (d*g)/(c + d*x) - (c*h)/(c + d*x))] * Sqrt[a + ((c + d*x)* \\
& (b - (b*c)/(c + d*x)))/d] * ((d*g * Sqrt[-((b*c - a*d)*(-d*g) + c*h)*(-b/(b*c \\
& - a*d)) + (c + d*x)^{-1})]/(-b*d*g) + a*d*h))] * (-f/(-d*e) + c*f)) + (c \\
& + d*x)^{-1}) * Sqrt[(-h/(-d*g) + c*h)) + (c + d*x)^{-1})/(f/(-d*e) + c*f) \\
& - h/(-d*g) + c*h))] * (((-b*d*g) + a*d*h)*EllipticE[ArcSin[Sqrt[((d*e - c*f) \\
&)*(h + (d*g)/(c + d*x) - (c*h)/(c + d*x)))/(d*(-f*g) + e*h)]]], ((b*c - a* \\
& d)*(-f*g) + e*h))/((-d*e) + c*f)*(-b*g) + a*h)))/((b*c - a*d)*(-d*g) + \\
& c*h)) - (b*EllipticF[ArcSin[Sqrt[((d*e - c*f)*(h + (d*g)/(c + d*x) - (c*h) \\
&)/(c + d*x)))/(d*(-f*g) + e*h)]]], ((b*c - a*d)*(-f*g) + e*h))/((-d*e) + \\
& c*f)*(-b*g) + a*h)))/(b*c - a*d))/((Sqrt[(-f/(-d*e) + c*f)) + (c + d*x) \\
& ^{-1})/(-f/(-d*e) + c*f)) + h/(-d*g) + c*h))] * Sqrt[(b + (-b*c) + a*d)/ \\
& (c + d*x))*(f + (d*e - c*f)/(c + d*x))*(h + (d*g - c*h)/(c + d*x))] - (c*h * \\
& Sqrt[-((b*c - a*d)*(-d*g) + c*h)*(-b/(b*c - a*d)) + (c + d*x)^{-1})]/(- \\
& (b*d*g) + a*d*h))] * (-f/(-d*e) + c*f)) + (c + d*x)^{-1}) * Sqrt[(-h/(-d*g) \\
& + c*h)) + (c + d*x)^{-1})/(f/(-d*e) + c*f) - h/(-d*g) + c*h))] * (((-b*d*g) \\
&) + a*d*h)*EllipticE[ArcSin[Sqrt[((d*e - c*f)*(h + (d*g)/(c + d*x) - (c*h)/ \\
& (c + d*x)))/(d*(-f*g) + e*h)]]], ((b*c - a*d)*(-f*g) + e*h))/((-d*e) + c \\
& *f)*(-b*g) + a*h)))/((b*c - a*d)*(-d*g) + c*h)) - (b*EllipticF[ArcSin[Sq \\
& rt[((d*e - c*f)*(h + (d*g)/(c + d*x) - (c*h)/(c + d*x)))/(d*(-f*g) + e*h) \\
&]], ((b*c - a*d)*(-f*g) + e*h))/((-d*e) + c*f)*(-b*g) + a*h)))/(b*c - a \\
& *d))/((Sqrt[(-f/(-d*e) + c*f)) + (c + d*x)^{-1})/(-f/(-d*e) + c*f)) + h \\
& /(-d*g) + c*h))] * Sqrt[(b + (-b*c) + a*d)/(c + d*x))*(f + (d*e - c*f)/(c + \\
& d*x))*(h + (d*g - c*h)/(c + d*x))] + (h * Sqrt[(-b/(b*c - a*d)) + (c + d*x) \\
&)^{-1})/(-b/(b*c - a*d)) + h/(-d*g) + c*h))] * Sqrt[(-f/(-d*e) + c*f)) +
\end{aligned}$$

$$\begin{aligned} & (c + dx)^{-1}/(-f/(-d*e) + c*f) + h/(-d*g) + c*h)) * (-h/(-d*g) + c*h) \\ & + (c + dx)^{-1}) * \text{EllipticF}[\text{ArcSin}[\text{Sqrt}[((-d*e) + c*f)*(-h - (d*g)/(c \\ & + d*x) + (c*h)/(c + d*x))]/(d*(-f*g) + e*h))], ((b*c - a*d)*(-f*g) + e*h \\ &)]/((-d*e) + c*f)*(-b*g) + a*h)]/(\text{Sqrt}[(-h/(-d*g) + c*h) + (c + d*x) \\ & ^{-1})/(f/(-d*e) + c*f) - h/(-d*g) + c*h)] * \text{Sqrt}[(b + (-b*c) + a*d)/(c + \\ & d*x)) * (f + (d*e - c*f)/(c + d*x)) * (h + (d*g - c*h)/(c + d*x))])) / ((f*g - \\ & e*h) * (b - (b*c)/(c + d*x) + (a*d)/(c + d*x)) * \text{Sqrt}[e + ((c + d*x) * (f - (c*f) \\ & / (c + d*x)))/d] * \text{Sqrt}[g + ((c + d*x) * (h - (c*h)/(c + d*x)))/d])) / (d * (b*c - \\ & a*d) * (b*e - a*f) * (b*g - a*h)) \end{aligned}$$

Maple [B] time = 0.095, size = 4660, normalized size = 10.9

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] $\text{int}(1/(b*x+a)^{(3/2)}/(d*x+c)^{(1/2)}/(f*x+e)^{(1/2)}/(h*x+g)^{(1/2)}, x)$

[Out]
$$\begin{aligned} & 2/(b*x+a)^{(1/2)}/(d*x+c)^{(1/2)}/(f*x+e)^{(1/2)}/(h*x+g)^{(1/2)} * (x^2*b^2*d*e^2*h^2 \\ & + \text{EllipticE}(((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^{(1/2)}, ((c*f-d*e)*(a*h-b*g) \\ &)/(c*h-d*g)/(a*f-b*e))^{(1/2)}) * x^2*b^2*d*f^2*g^2 * ((e*h-f*g)*(d*x+c)/(c*h-d*g) \\ &)/(f*x+e))^{(1/2)} * ((e*h-f*g)*(b*x+a)/(a*h-b*g)/(f*x+e))^{(1/2)} * ((a*f-b*e)*(h \\ & x+g)/(a*h-b*g)/(f*x+e))^{(1/2)} + \text{EllipticF}(((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e) \\ &))^{(1/2)}, ((c*f-d*e)*(a*h-b*g)/(c*h-d*g)/(a*f-b*e))^{(1/2)}) * x^2*a^2*d*f^2*h^2 \\ & * ((e*h-f*g)*(d*x+c)/(c*h-d*g)/(f*x+e))^{(1/2)} * ((e*h-f*g)*(b*x+a)/(a*h-b*g)/(\\ & f*x+e))^{(1/2)} * ((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^{(1/2)} + \text{EllipticE}(((a*f-b \\ & *e)*(h*x+g)/(a*h-b*g)/(f*x+e))^{(1/2)}, ((c*f-d*e)*(a*h-b*g)/(c*h-d*g)/(a*f-b* \\ & e))^{(1/2)}) * a*b*c*e^2*h^2 * ((e*h-f*g)*(d*x+c)/(c*h-d*g)/(f*x+e))^{(1/2)} * ((e*h- \\ & f*g)*(b*x+a)/(a*h-b*g)/(f*x+e))^{(1/2)} * ((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e) \\ &)^{(1/2)} - \text{EllipticE}(((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^{(1/2)}, ((c*f-d*e)*(a* \\ & h-b*g)/(c*h-d*g)/(a*f-b*e))^{(1/2)}) * b^2*c*e^2*g*h * ((e*h-f*g)*(d*x+c)/(c*h-d* \\ & g)/(f*x+e))^{(1/2)} * ((e*h-f*g)*(b*x+a)/(a*h-b*g)/(f*x+e))^{(1/2)} * ((a*f-b*e)*(h \\ & *x+g)/(a*h-b*g)/(f*x+e))^{(1/2)} - \text{EllipticF}(((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+ \\ & e))^{(1/2)}, ((c*f-d*e)*(a*h-b*g)/(c*h-d*g)/(a*f-b*e))^{(1/2)}) * a*b*c*e^2*h^2 * ((\\ & e*h-f*g)*(d*x+c)/(c*h-d*g)/(f*x+e))^{(1/2)} * ((e*h-f*g)*(b*x+a)/(a*h-b*g)/(f*x \\ & +e))^{(1/2)} * ((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^{(1/2)} + \text{EllipticF}(((a*f-b*e) \\ &) * (h*x+g)/(a*h-b*g)/(f*x+e))^{(1/2)}, ((c*f-d*e)*(a*h-b*g)/(c*h-d*g)/(a*f-b*e)) \\ & ^{(1/2)}) * b^2*c*e^2*g*h * ((e*h-f*g)*(d*x+c)/(c*h-d*g)/(f*x+e))^{(1/2)} * ((e*h-f*g) \\ &) * (b*x+a)/(a*h-b*g)/(f*x+e))^{(1/2)} * ((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^{(1 \\ & /2)} - 2 * \text{EllipticE}(((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^{(1/2)}, ((c*f-d*e)*(a*h \\ & -b*g)/(c*h-d*g)/(a*f-b*e))^{(1/2)}) * x * a*b*d*e*f*g*h * ((e*h-f*g)*(d*x+c)/(c*h-d \\ & *g)/(f*x+e))^{(1/2)} * ((e*h-f*g)*(b*x+a)/(a*h-b*g)/(f*x+e))^{(1/2)} * ((a*f-b*e)*(\end{aligned}$$

$$\begin{aligned}
& h*x+g)/(a*h-b*g)/(f*x+e))^{(1/2)}-x*a*b*d*e*f*g*h+EllipticE(((a*f-b*e)*(h*x+g) \\
&)/(a*h-b*g)/(f*x+e))^{(1/2)},((c*f-d*e)*(a*h-b*g)/(c*h-d*g)/(a*f-b*e))^{(1/2)}) \\
& *b^2*d*e^2*g^2*((e*h-f*g)*(d*x+c)/(c*h-d*g)/(f*x+e))^{(1/2)*((e*h-f*g)*(b*x+ \\
& a)/(a*h-b*g)/(f*x+e))^{(1/2)*((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^{(1/2)}+x*b \\
& ^2*c*e^2*h^2+a*b*c*f^2*g^2+b^2*c*e^2*g*h-b^2*c*e*f*g^2+x*a*b*d*f^2*g^2+x*b^ \\
& 2*d*e^2*g*h-x*b^2*d*e*f*g^2-x^2*a*b*d*e*f*h^2+x^2*a*b*d*f^2*g*h-x^2*b^2*d*e \\
& *f*g*h-x*a*b*c*e*f*h^2+x*a*b*c*f^2*g*h-x*b^2*c*e*f*g*h-2*EllipticF(((a*f-b* \\
& e)*(h*x+g)/(a*h-b*g)/(f*x+e))^{(1/2)},((c*f-d*e)*(a*h-b*g)/(c*h-d*g)/(a*f-b*e \\
&))^{(1/2)})*x*a*b*d*e*f*g*h*((e*h-f*g)*(d*x+c)/(c*h-d*g)/(f*x+e))^{(1/2)*((e*h \\
& -f*g)*(b*x+a)/(a*h-b*g)/(f*x+e))^{(1/2)*((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e) \\
&)^{(1/2)}+EllipticF(((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^{(1/2)},((c*f-d*e)*(a \\
& *h-b*g)/(c*h-d*g)/(a*f-b*e))^{(1/2)})*a^2*d*e^2*h^2*((e*h-f*g)*(d*x+c)/(c*h-d \\
& *g)/(f*x+e))^{(1/2)*((e*h-f*g)*(b*x+a)/(a*h-b*g)/(f*x+e))^{(1/2)*((a*f-b*e)*(\\
& h*x+g)/(a*h-b*g)/(f*x+e))^{(1/2)}-a*b*c*e*f*g*h-EllipticE(((a*f-b*e)*(h*x+g)/ \\
& (a*h-b*g)/(f*x+e))^{(1/2)},((c*f-d*e)*(a*h-b*g)/(c*h-d*g)/(a*f-b*e))^{(1/2)})*x \\
& ^2*a*b*d*f^2*g*h*((e*h-f*g)*(d*x+c)/(c*h-d*g)/(f*x+e))^{(1/2)*((e*h-f*g)*(b* \\
& x+a)/(a*h-b*g)/(f*x+e))^{(1/2)*((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^{(1/2)}-E \\
& llipticF(((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^{(1/2)},((c*f-d*e)*(a*h-b*g)/(\\
& c*h-d*g)/(a*f-b*e))^{(1/2)})*x^2*a*b*d*f^2*g*h*((e*h-f*g)*(d*x+c)/(c*h-d*g)/(\\
& f*x+e))^{(1/2)*((e*h-f*g)*(b*x+a)/(a*h-b*g)/(f*x+e))^{(1/2)*((a*f-b*e)*(h*x+g) \\
&)/(a*h-b*g)/(f*x+e))^{(1/2)}+2*EllipticE(((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e) \\
&)^{(1/2)},((c*f-d*e)*(a*h-b*g)/(c*h-d*g)/(a*f-b*e))^{(1/2)})*x*a*b*c*e*f*h^2*((\\
& e*h-f*g)*(d*x+c)/(c*h-d*g)/(f*x+e))^{(1/2)*((e*h-f*g)*(b*x+a)/(a*h-b*g)/(f*x \\
& +e))^{(1/2)*((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^{(1/2)}-2*EllipticE(((a*f-b* \\
& e)*(h*x+g)/(a*h-b*g)/(f*x+e))^{(1/2)},((c*f-d*e)*(a*h-b*g)/(c*h-d*g)/(a*f-b*e \\
&))^{(1/2)})*x*b^2*c*e*f*g*h*((e*h-f*g)*(d*x+c)/(c*h-d*g)/(f*x+e))^{(1/2)*((e*h \\
& -f*g)*(b*x+a)/(a*h-b*g)/(f*x+e))^{(1/2)*((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e) \\
&)^{(1/2)}-2*EllipticF(((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^{(1/2)},((c*f-d*e)* \\
& (a*h-b*g)/(c*h-d*g)/(a*f-b*e))^{(1/2)})*x*a*b*c*e*f*h^2*((e*h-f*g)*(d*x+c)/(c \\
& *h-d*g)/(f*x+e))^{(1/2)*((e*h-f*g)*(b*x+a)/(a*h-b*g)/(f*x+e))^{(1/2)*((a*f-b* \\
& e)*(h*x+g)/(a*h-b*g)/(f*x+e))^{(1/2)}+2*EllipticF(((a*f-b*e)*(h*x+g)/(a*h-b*g) \\
&)/(f*x+e))^{(1/2)},((c*f-d*e)*(a*h-b*g)/(c*h-d*g)/(a*f-b*e))^{(1/2)})*x*b^2*c*e \\
& *f*g*h*((e*h-f*g)*(d*x+c)/(c*h-d*g)/(f*x+e))^{(1/2)*((e*h-f*g)*(b*x+a)/(a*h- \\
& b*g)/(f*x+e))^{(1/2)*((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^{(1/2)}-EllipticE((\\
& (a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^{(1/2)},((c*f-d*e)*(a*h-b*g)/(c*h-d*g)/(\\
& a*f-b*e))^{(1/2)})*a*b*d*e^2*g*h*((e*h-f*g)*(d*x+c)/(c*h-d*g)/(f*x+e))^{(1/2)* \\
& ((e*h-f*g)*(b*x+a)/(a*h-b*g)/(f*x+e))^{(1/2)*((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f \\
& *x+e))^{(1/2)}-EllipticF(((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^{(1/2)},((c*f-d* \\
& e)*(a*h-b*g)/(c*h-d*g)/(a*f-b*e))^{(1/2)})*a*b*d*e^2*g*h*((e*h-f*g)*(d*x+c)/(\\
& c*h-d*g)/(f*x+e))^{(1/2)*((e*h-f*g)*(b*x+a)/(a*h-b*g)/(f*x+e))^{(1/2)*((a*f-b \\
& *e)*(h*x+g)/(a*h-b*g)/(f*x+e))^{(1/2)}+EllipticE(((a*f-b*e)*(h*x+g)/(a*h-b*g) \\
&)/(f*x+e))^{(1/2)},((c*f-d*e)*(a*h-b*g)/(c*h-d*g)/(a*f-b*e))^{(1/2)})*x^2*a*b*c* \\
& f^2*h^2*((e*h-f*g)*(d*x+c)/(c*h-d*g)/(f*x+e))^{(1/2)*((e*h-f*g)*(b*x+a)/(a*h \\
& -b*g)/(f*x+e))^{(1/2)*((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^{(1/2)}-EllipticE(\\
& ((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^{(1/2)},((c*f-d*e)*(a*h-b*g)/(c*h-d*g)/
\end{aligned}$$

$$\begin{aligned} & (a*f-b*e)^{(1/2)}*x^2*b^2*c*f^2*g*h*((e*h-f*g)*(d*x+c)/(c*h-d*g)/(f*x+e))^{(1/2)} \\ & *((e*h-f*g)*(b*x+a)/(a*h-b*g)/(f*x+e))^{(1/2)}*((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^{(1/2)} \\ & -\text{EllipticF}(((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^{(1/2)},((c*f-d*e)*(a*h-b*g)/(c*h-d*g)/(a*f-b*e))^{(1/2)}) \\ & *x^2*a*b*c*f^2*h^2*((e*h-f*g)*(d*x+c)/(c*h-d*g)/(f*x+e))^{(1/2)}*((e*h-f*g)*(b*x+a)/(a*h-b*g)/(f*x+e))^{(1/2)} \\ & *((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^{(1/2)}+\text{EllipticF}(((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^{(1/2)},((c*f-d*e)*(a*h-b*g)/(c*h-d*g)/(a*f-b*e))^{(1/2)}) \\ & *x^2*b^2*c*f^2*g*h*((e*h-f*g)*(d*x+c)/(c*h-d*g)/(f*x+e))^{(1/2)}*((e*h-f*g)*(b*x+a)/(a*h-b*g)/(f*x+e))^{(1/2)} \\ & *((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^{(1/2)}+2*\text{EllipticE}(((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^{(1/2)},((c*f-d*e)*(a*h-b*g)/(c*h-d*g)/(a*f-b*e))^{(1/2)}) \\ & *x*b^2*d*e*f*g^2*((e*h-f*g)*(d*x+c)/(c*h-d*g)/(f*x+e))^{(1/2)}*((e*h-f*g)*(b*x+a)/(a*h-b*g)/(f*x+e))^{(1/2)} \\ & *((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^{(1/2)}+2*\text{EllipticF}(((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^{(1/2)},((c*f-d*e)*(a*h-b*g)/(c*h-d*g)/(a*f-b*e))^{(1/2)}) \\ & *x*a^2*d*e*f*h^2*((e*h-f*g)*(d*x+c)/(c*h-d*g)/(f*x+e))^{(1/2)}*((e*h-f*g)*(b*x+a)/(a*h-b*g)/(f*x+e))^{(1/2)} \\ & *((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^{(1/2)})/(a*h-b*g)/(e*h-f*g)/(a*f-b*e)/(a*d-b*c) \end{aligned}$$

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx+a)^{\frac{3}{2}} \sqrt{dx+c} \sqrt{fx+e} \sqrt{hx+g}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(b*x+a)^(3/2)/(d*x+c)^(1/2)/(f*x+e)^(1/2)/(h*x+g)^(1/2),x, algorith="maxima")

[Out] integrate(1/((b*x + a)^(3/2)*sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)), x)

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral} \left(\frac{\sqrt{bx+a}}{b^2dfhx^5 + a^2ceg + (b^2dfg + (b^2de + (b^2c + 2abd)f)h)x^4 + ((b^2de + (b^2c + 2abd)f)g + ((b^2c + 2abd)e + (2$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(b*x+a)^(3/2)/(d*x+c)^(1/2)/(f*x+e)^(1/2)/(h*x+g)^(1/2),x, algorith="fricas")

```
[Out] integral(sqrt(b*x + a)*sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)/(b^2*d*f*h
*x^5 + a^2*c*e*g + (b^2*d*f*g + (b^2*d*e + (b^2*c + 2*a*b*d)*f)*h)*x^4 + ((
b^2*d*e + (b^2*c + 2*a*b*d)*f)*g + ((b^2*c + 2*a*b*d)*e + (2*a*b*c + a^2*d)
*f)*h)*x^3 + (((b^2*c + 2*a*b*d)*e + (2*a*b*c + a^2*d)*f)*g + (a^2*c*f + (2
*a*b*c + a^2*d)*e)*h)*x^2 + (a^2*c*e*h + (a^2*c*f + (2*a*b*c + a^2*d)*e)*g)
*x), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*x+a)**(3/2)/(d*x+c)**(1/2)/(f*x+e)**(1/2)/(h*x+g)**(1/2), x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx+a)^{\frac{3}{2}} \sqrt{dx+c} \sqrt{fx+e} \sqrt{hx+g}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*x+a)^(3/2)/(d*x+c)^(1/2)/(f*x+e)^(1/2)/(h*x+g)^(1/2), x, algo
rithm="giac")
```

```
[Out] integrate(1/((b*x + a)^(3/2)*sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)), x)
```


$$3.111 \quad \int \frac{1}{(a+bx)^{3/2}(c+dx)^{3/2}\sqrt{e+fx}\sqrt{g+hx}} dx$$

Optimal. Leaf size=786

$$\frac{4bd\sqrt{g+hx}\sqrt{\frac{(c+dx)(be-af)}{(a+bx)(de-cf)}}\text{EllipticF}\left(\sin^{-1}\left(\frac{\sqrt{e+fx}\sqrt{bg-ah}}{\sqrt{a+bx}\sqrt{fg-eh}}\right),-\frac{(bc-ad)(fg-eh)}{(bg-ah)(de-cf)}\right)}{\sqrt{c+dx}(bc-ad)^2\sqrt{bg-ah}\sqrt{fg-eh}\sqrt{\frac{(g+hx)(be-af)}{(a+bx)(fg-eh)}}} + \frac{2b\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}(a^2d^2fh-ab)}{\sqrt{a+bx}(bc-ad)^2(be-af)}$$

[Out] $(-2*d^3*\text{Sqrt}[a + b*x]*\text{Sqrt}[e + f*x]*\text{Sqrt}[g + h*x])/((b*c - a*d)^2*(d*e - c*f)*(d*g - c*h)*\text{Sqrt}[c + d*x]) - (2*b^3*\text{Sqrt}[c + d*x]*\text{Sqrt}[e + f*x]*\text{Sqrt}[g + h*x])/((b*c - a*d)^2*(b*e - a*f)*(b*g - a*h)*\text{Sqrt}[a + b*x]) + (2*b*(a^2*d^2*f*h - a*b*d^2*(f*g + e*h) + b^2*(2*d^2*e*g + c^2*f*h - c*d*(f*g + e*h)))*\text{Sqrt}[c + d*x]*\text{Sqrt}[e + f*x]*\text{Sqrt}[g + h*x])/((b*c - a*d)^2*(b*e - a*f)*(d*e - c*f)*(b*g - a*h)*(d*g - c*h)*\text{Sqrt}[a + b*x]) - (2*\text{Sqrt}[f*g - e*h]*(a^2*d^2*f*h - a*b*d^2*(f*g + e*h) + b^2*(2*d^2*e*g + c^2*f*h - c*d*(f*g + e*h)))*\text{Sqrt}[c + d*x]*\text{Sqrt}[-((b*e - a*f)*(g + h*x))/((f*g - e*h)*(a + b*x))])*\text{EllipticE}[\text{ArcSin}[(\text{Sqrt}[b*g - a*h]*\text{Sqrt}[e + f*x])/(\text{Sqrt}[f*g - e*h]*\text{Sqrt}[a + b*x])], -((b*c - a*d)*(f*g - e*h))/((d*e - c*f)*(b*g - a*h)))]/((b*c - a*d)^2*(b*e - a*f)*(d*e - c*f)*\text{Sqrt}[b*g - a*h]*(d*g - c*h)*\text{Sqrt}[(b*e - a*f)*(c + d*x)]/((d*e - c*f)*(a + b*x)))*\text{Sqrt}[g + h*x]) - (4*b*d*\text{Sqrt}[(b*e - a*f)*(c + d*x)]/((d*e - c*f)*(a + b*x)))*\text{Sqrt}[g + h*x]*\text{EllipticF}[\text{ArcSin}[(\text{Sqrt}[b*g - a*h]*\text{Sqrt}[e + f*x])/(\text{Sqrt}[f*g - e*h]*\text{Sqrt}[a + b*x])], -((b*c - a*d)*(f*g - e*h))/((d*e - c*f)*(b*g - a*h)))]/((b*c - a*d)^2*\text{Sqrt}[b*g - a*h]*\text{Sqrt}[f*g - e*h]*\text{Sqrt}[c + d*x]*\text{Sqrt}[-((b*e - a*f)*(g + h*x))/((f*g - e*h)*(a + b*x))])]$

Rubi [F] time = 0.010114, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.$, Rules used = {}

$$\int \frac{1}{(a+bx)^{3/2}(c+dx)^{3/2}\sqrt{e+fx}\sqrt{g+hx}} dx$$

Verification is Not applicable to the result.

[In] Int[1/((a + b*x)^(3/2)*(c + d*x)^(3/2)*Sqrt[e + f*x]*Sqrt[g + h*x]),x]

[Out] Defer[Int][1/((a + b*x)^(3/2)*(c + d*x)^(3/2)*Sqrt[e + f*x]*Sqrt[g + h*x]), x]

Rubi steps

$$\int \frac{1}{(a+bx)^{3/2}(c+dx)^{3/2}\sqrt{e+fx}\sqrt{g+hx}} dx = \int \frac{1}{(a+bx)^{3/2}(c+dx)^{3/2}\sqrt{e+fx}\sqrt{g+hx}} dx$$

Mathematica [B] time = 17.4584, size = 7061, normalized size = 8.98

Result too large to show

Warning: Unable to verify antiderivative.

[In] Integrate[1/((a + b*x)^(3/2)*(c + d*x)^(3/2)*Sqrt[e + f*x]*Sqrt[g + h*x]), x
]

[Out] Result too large to show

Maple [B] time = 0.224, size = 21094, normalized size = 26.8

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] int(1/(b*x+a)^(3/2)/(d*x+c)^(3/2)/(f*x+e)^(1/2)/(h*x+g)^(1/2), x)

[Out] result too large to display

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx+a)^{\frac{3}{2}}(dx+c)^{\frac{3}{2}}\sqrt{fx+e}\sqrt{hx+g}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(b*x+a)^(3/2)/(d*x+c)^(3/2)/(f*x+e)^(1/2)/(h*x+g)^(1/2), x, algo
rithm="maxima")

[Out] integrate(1/((b*x + a)^(3/2)*(d*x + c)^(3/2)*sqrt(f*x + e)*sqrt(h*x + g)), x)

Fricas [F] time = 0., size = 0, normalized size = 0.

integral $\left(\frac{1}{b^2d^2fhx^6 + a^2c^2eg + (b^2d^2fg + (b^2d^2e + 2(b^2cd + abd^2)f)h)x^5 + ((b^2d^2e + 2(b^2cd + abd^2)f)g + (2(b^2cd +$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(b*x+a)^(3/2)/(d*x+c)^(3/2)/(f*x+e)^(1/2)/(h*x+g)^(1/2), x, algo rithm="fricas")

[Out] integral(sqrt(b*x + a)*sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)/(b^2*d^2*f *h*x^6 + a^2*c^2*e*g + (b^2*d^2*f*g + (b^2*d^2*e + 2*(b^2*c*d + a*b*d^2)*f) *h)*x^5 + ((b^2*d^2*e + 2*(b^2*c*d + a*b*d^2)*f)*g + (2*(b^2*c*d + a*b*d^2) *e + (b^2*c^2 + 4*a*b*c*d + a^2*d^2)*f)*h)*x^4 + ((2*(b^2*c*d + a*b*d^2)*e + (b^2*c^2 + 4*a*b*c*d + a^2*d^2)*f)*g + ((b^2*c^2 + 4*a*b*c*d + a^2*d^2)*e + 2*(a*b*c^2 + a^2*c*d)*f)*h)*x^3 + (((b^2*c^2 + 4*a*b*c*d + a^2*d^2)*e + 2*(a*b*c^2 + a^2*c*d)*f)*g + (a^2*c^2*f + 2*(a*b*c^2 + a^2*c*d)*e)*h)*x^2 + (a^2*c^2*e*h + (a^2*c^2*f + 2*(a*b*c^2 + a^2*c*d)*e)*g)*x), x)

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(b*x+a)**(3/2)/(d*x+c)**(3/2)/(f*x+e)**(1/2)/(h*x+g)**(1/2), x)

[Out] Timed out

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx + a)^{\frac{3}{2}}(dx + c)^{\frac{3}{2}}\sqrt{fx + e}\sqrt{hx + g}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*x+a)^(3/2)/(d*x+c)^(3/2)/(f*x+e)^(1/2)/(h*x+g)^(1/2),x, algo  
rithm="giac")
```

```
[Out] integrate(1/((b*x + a)^(3/2)*(d*x + c)^(3/2)*sqrt(f*x + e)*sqrt(h*x + g)),  
x)
```

$$3.112 \quad \int \frac{x^4(e+fx)^n}{(a+bx)(c+dx)} dx$$

Optimal. Leaf size=319

$$\frac{(a^2d^2 + abcd + b^2c^2)(e+fx)^{n+1}}{b^3d^3f(n+1)} - \frac{a^4(e+fx)^{n+1} {}_2F_1\left(1, n+1; n+2; \frac{b(e+fx)}{be-af}\right)}{b^3(n+1)(bc-ad)(be-af)} + \frac{e(ad+bc)(e+fx)^{n+1}}{b^2d^2f^2(n+1)} - \frac{(ad+bc)(e+fx)^{n+1}}{b^2d^2f^2(n+1)}$$

[Out] $(e^2(e+fx)^{(1+n)})/(b*d*f^3*(1+n)) + ((b*c+a*d)*e*(e+fx)^{(1+n)})/(b^2*d^2*f^2*(1+n)) + ((b^2*c^2+a*b*c*d+a^2*d^2)*(e+fx)^{(1+n)})/(b^3*d^3*f*(1+n)) - (2*e*(e+fx)^{(2+n)})/(b*d*f^3*(2+n)) - ((b*c+a*d)*(e+fx)^{(2+n)})/(b^2*d^2*f^2*(2+n)) + (e+fx)^{(3+n)}/(b*d*f^3*(3+n)) - (a^4*(e+fx)^{(1+n)}*Hypergeometric2F1[1, 1+n, 2+n, (b*(e+fx))/(b*e-a*f)])/(b^3*(b*c-a*d)*(b*e-a*f)*(1+n)) + (c^4*(e+fx)^{(1+n)}*Hypergeometric2F1[1, 1+n, 2+n, (d*(e+fx))/(d*e-c*f)])/(d^3*(b*c-a*d)*(d*e-c*f)*(1+n))$

Rubi [A] time = 0.279362, antiderivative size = 319, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 3, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.12$, Rules used = {180, 43, 68}

$$\frac{(a^2d^2 + abcd + b^2c^2)(e+fx)^{n+1}}{b^3d^3f(n+1)} - \frac{a^4(e+fx)^{n+1} {}_2F_1\left(1, n+1; n+2; \frac{b(e+fx)}{be-af}\right)}{b^3(n+1)(bc-ad)(be-af)} + \frac{e(ad+bc)(e+fx)^{n+1}}{b^2d^2f^2(n+1)} - \frac{(ad+bc)(e+fx)^{n+1}}{b^2d^2f^2(n+1)}$$

Antiderivative was successfully verified.

[In] Int[(x^4*(e+fx)^n)/((a+bx)*(c+dx)),x]

[Out] $(e^2(e+fx)^{(1+n)})/(b*d*f^3*(1+n)) + ((b*c+a*d)*e*(e+fx)^{(1+n)})/(b^2*d^2*f^2*(1+n)) + ((b^2*c^2+a*b*c*d+a^2*d^2)*(e+fx)^{(1+n)})/(b^3*d^3*f*(1+n)) - (2*e*(e+fx)^{(2+n)})/(b*d*f^3*(2+n)) - ((b*c+a*d)*(e+fx)^{(2+n)})/(b^2*d^2*f^2*(2+n)) + (e+fx)^{(3+n)}/(b*d*f^3*(3+n)) - (a^4*(e+fx)^{(1+n)}*Hypergeometric2F1[1, 1+n, 2+n, (b*(e+fx))/(b*e-a*f)])/(b^3*(b*c-a*d)*(b*e-a*f)*(1+n)) + (c^4*(e+fx)^{(1+n)}*Hypergeometric2F1[1, 1+n, 2+n, (d*(e+fx))/(d*e-c*f)])/(d^3*(b*c-a*d)*(d*e-c*f)*(1+n))$

Rule 180

Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_)*((e_.) + (f_.)*(x_))^(p_)*((g_.) + (h_.)*(x_))^(q_), x_Symbol] := Int[ExpandIntegrand[(a + b*x)^(m)*(c + d*x)^(n)*(e + f*x)^(p)*(g + h*x)^(q)], x]


```
[Out] ((e + f*x)^(1 + n)*(-(a^4*d^3*Hypergeometric2F1[1, 1 + n, 2 + n, (b*(e + f
*x))/(b*e - a*f]])/((b*c - a*d)*(b*e - a*f))) + (-((b*c - a*d)*(-(d*e) + c*
f)*(a^2*d^2*f^2*(6 + 5*n + n^2) + a*b*d*f*(3 + n)*(c*f*(2 + n) + d*(e - f*(
1 + n)*x)) + b^2*(c^2*f^2*(6 + 5*n + n^2) + c*d*f*(3 + n)*(e - f*(1 + n)*x)
+ d^2*(2*e^2 - 2*e*f*(1 + n)*x + f^2*(2 + 3*n + n^2)*x^2)))) + b^3*c^4*f^3
*(6 + 5*n + n^2)*Hypergeometric2F1[1, 1 + n, 2 + n, (d*(e + f*x))/(d*e - c*
f]])/((-b*c) + a*d)*f^3*(-(d*e) + c*f)*(2 + n)*(3 + n)))/(b^3*d^3*(1 + n)
)
```

Maple [F] time = 0.089, size = 0, normalized size = 0.

$$\int \frac{(fx + e)^n x^4}{(bx + a)(dx + c)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(f*x+e)^n/(b*x+a)/(d*x+c), x)
```

```
[Out] int(x^4*(f*x+e)^n/(b*x+a)/(d*x+c), x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(fx + e)^n x^4}{(bx + a)(dx + c)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(f*x+e)^n/(b*x+a)/(d*x+c), x, algorithm="maxima")
```

```
[Out] integrate((f*x + e)^n*x^4/((b*x + a)*(d*x + c)), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral} \left(\frac{(fx + e)^n x^4}{bdx^2 + ac + (bc + ad)x}, x \right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(f*x+e)^n/(b*x+a)/(d*x+c),x, algorithm="fricas")
```

```
[Out] integral((f*x + e)^n*x^4/(b*d*x^2 + a*c + (b*c + a*d)*x), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(f*x+e)**n/(b*x+a)/(d*x+c),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(fx + e)^n x^4}{(bx + a)(dx + c)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(f*x+e)^n/(b*x+a)/(d*x+c),x, algorithm="giac")
```

```
[Out] integrate((f*x + e)^n*x^4/((b*x + a)*(d*x + c)), x)
```


$$3.113 \quad \int \frac{x^3(e+fx)^n}{(a+bx)(c+dx)} dx$$

Optimal. Leaf size=216

$$\frac{a^3(e+fx)^{n+1} {}_2F_1\left(1, n+1; n+2; \frac{b(e+fx)}{be-af}\right)}{b^2(n+1)(bc-ad)(be-af)} - \frac{(ad+bc)(e+fx)^{n+1}}{b^2d^2f(n+1)} - \frac{c^3(e+fx)^{n+1} {}_2F_1\left(1, n+1; n+2; \frac{d(e+fx)}{de-cf}\right)}{d^2(n+1)(bc-ad)(de-cf)} - \frac{e(e+fx)^{n+1}}{bd^2f^2(n+1)}$$

```
[Out] -((e*(e + f*x)^(1 + n))/(b*d*f^2*(1 + n))) - ((b*c + a*d)*(e + f*x)^(1 + n))
)/(b^2*d^2*f*(1 + n)) + (e + f*x)^(2 + n)/(b*d*f^2*(2 + n)) + (a^3*(e + f*x)
)^(1 + n)*Hypergeometric2F1[1, 1 + n, 2 + n, (b*(e + f*x))/(b*e - a*f)]/(b
^2*(b*c - a*d)*(b*e - a*f)*(1 + n)) - (c^3*(e + f*x)^(1 + n)*Hypergeometric
2F1[1, 1 + n, 2 + n, (d*(e + f*x))/(d*e - c*f)]/(d^2*(b*c - a*d)*(d*e - c*
f)*(1 + n))
```

Rubi [A] time = 0.15416, antiderivative size = 216, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 3, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.12$, Rules used = {180, 43, 68}

$$\frac{a^3(e+fx)^{n+1} {}_2F_1\left(1, n+1; n+2; \frac{b(e+fx)}{be-af}\right)}{b^2(n+1)(bc-ad)(be-af)} - \frac{(ad+bc)(e+fx)^{n+1}}{b^2d^2f(n+1)} - \frac{c^3(e+fx)^{n+1} {}_2F_1\left(1, n+1; n+2; \frac{d(e+fx)}{de-cf}\right)}{d^2(n+1)(bc-ad)(de-cf)} - \frac{e(e+fx)^{n+1}}{bd^2f^2(n+1)}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(e + f*x)^n)/((a + b*x)*(c + d*x)), x]
```

```
[Out] -((e*(e + f*x)^(1 + n))/(b*d*f^2*(1 + n))) - ((b*c + a*d)*(e + f*x)^(1 + n))
)/(b^2*d^2*f*(1 + n)) + (e + f*x)^(2 + n)/(b*d*f^2*(2 + n)) + (a^3*(e + f*x)
)^(1 + n)*Hypergeometric2F1[1, 1 + n, 2 + n, (b*(e + f*x))/(b*e - a*f)]/(b
^2*(b*c - a*d)*(b*e - a*f)*(1 + n)) - (c^3*(e + f*x)^(1 + n)*Hypergeometric
2F1[1, 1 + n, 2 + n, (d*(e + f*x))/(d*e - c*f)]/(d^2*(b*c - a*d)*(d*e - c*
f)*(1 + n))
```

Rule 180

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_)*((e_.) + (f_.)*(x_))
)^(p_)*((g_.) + (h_.)*(x_))^(q_), x_Symbol] := Int[ExpandIntegrand[(a + b*x)
]^m*(c + d*x)^n*(e + f*x)^p*(g + h*x)^q, x] /; FreeQ[{a, b, c, d, e, f,
g, h, m, n}, x] && IntegersQ[p, q]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && (!IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 68

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] := Simp[(((
b*c - a*d)^n*(a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a
+ b*x))/(b*c - a*d))])/(b^(n + 1)*(m + 1)), x] /; FreeQ[{a, b, c, d, m}, x]
&& NeQ[b*c - a*d, 0] && !IntegerQ[m] && IntegerQ[n]
```

Rubi steps

$$\begin{aligned} \int \frac{x^3(e+fx)^n}{(a+bx)(c+dx)} dx &= \int \left(\frac{(-bc-ad)(e+fx)^n}{b^2d^2} + \frac{x(e+fx)^n}{bd} - \frac{a^3(e+fx)^n}{b^2(bc-ad)(a+bx)} - \frac{c^3(e+fx)^n}{d^2(-bc+ad)(c+dx)} \right) dx \\ &= -\frac{(bc+ad)(e+fx)^{1+n}}{b^2d^2f(1+n)} + \frac{\int x(e+fx)^n dx}{bd} - \frac{a^3 \int \frac{(e+fx)^n}{a+bx} dx}{b^2(bc-ad)} + \frac{c^3 \int \frac{(e+fx)^n}{c+dx} dx}{d^2(bc-ad)} \\ &= -\frac{(bc+ad)(e+fx)^{1+n}}{b^2d^2f(1+n)} + \frac{a^3(e+fx)^{1+n} {}_2F_1\left(1, 1+n; 2+n; \frac{b(e+fx)}{be-af}\right)}{b^2(bc-ad)(be-af)(1+n)} - \frac{c^3(e+fx)^{1+n} {}_2F_1\left(1, 1+n; 2+n; \frac{d(e+fx)}{de-cf}\right)}{d^2(bc-ad)(de-cf)(1+n)} \\ &= -\frac{e(e+fx)^{1+n}}{bd^2f(1+n)} - \frac{(bc+ad)(e+fx)^{1+n}}{b^2d^2f(1+n)} + \frac{(e+fx)^{2+n}}{bd^2f(2+n)} + \frac{a^3(e+fx)^{1+n} {}_2F_1\left(1, 1+n; 2+n; \frac{b(e+fx)}{be-af}\right)}{b^2(bc-ad)(be-af)(1+n)} \end{aligned}$$

Mathematica [A] time = 0.496155, size = 174, normalized size = 0.81

$$\frac{(e+fx)^{n+1} \left(\frac{a^3 {}_2F_1\left(1, n+1; n+2; \frac{b(e+fx)}{be-af}\right)}{be-af} + \frac{(bc-ad)(cf-de)(adf(n+2)+bcf(n+2)+bd(e-f(n+1)x))-b^2c^3f^2(n+2) {}_2F_1\left(1, n+1; n+2; \frac{d(e+fx)}{de-cf}\right)}{d^2f^2(n+2)(de-cf)} \right)}{b^2(n+1)(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*(e + f*x)^n)/((a + b*x)*(c + d*x)), x]
```

```
[Out] ((e + f*x)^(1 + n)*((a^3*Hypergeometric2F1[1, 1 + n, 2 + n, (b*(e + f*x))/(
b*e - a*f)])/(b*e - a*f) + ((b*c - a*d)*(-(d*e) + c*f)*(b*c*f*(2 + n) + a*d
*f*(2 + n) + b*d*(e - f*(1 + n)*x)) - b^2*c^3*f^2*(2 + n)*Hypergeometric2F1
[1, 1 + n, 2 + n, (d*(e + f*x))/(d*e - c*f)])/(d^2*f^2*(d*e - c*f)*(2 + n))
```

))/(b^2*(b*c - a*d)*(1 + n))

Maple [F] time = 0.077, size = 0, normalized size = 0.

$$\int \frac{(fx + e)^n x^3}{(bx + a)(dx + c)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(x^3*(f*x+e)^n/(b*x+a)/(d*x+c), x)

[Out] int(x^3*(f*x+e)^n/(b*x+a)/(d*x+c), x)

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(fx + e)^n x^3}{(bx + a)(dx + c)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^3*(f*x+e)^n/(b*x+a)/(d*x+c), x, algorithm="maxima")

[Out] integrate((f*x + e)^n*x^3/((b*x + a)*(d*x + c)), x)

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{(fx + e)^n x^3}{bdx^2 + ac + (bc + ad)x}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^3*(f*x+e)^n/(b*x+a)/(d*x+c), x, algorithm="fricas")

[Out] integral((f*x + e)^n*x^3/(b*d*x^2 + a*c + (b*c + a*d)*x), x)

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^3 (e + fx)^n}{(a + bx)(c + dx)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x**3*(f*x+e)**n/(b*x+a)/(d*x+c),x)

[Out] Integral(x**3*(e + f*x)**n/((a + b*x)*(c + d*x)), x)

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(fx + e)^n x^3}{(bx + a)(dx + c)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^3*(f*x+e)^n/(b*x+a)/(d*x+c),x, algorithm="giac")

[Out] integrate((f*x + e)^n*x^3/((b*x + a)*(d*x + c)), x)

$$3.114 \quad \int \frac{x^2(e+fx)^n}{(a+bx)(c+dx)} dx$$

Optimal. Leaf size=158

$$-\frac{a^2(e+fx)^{n+1} {}_2F_1\left(1, n+1; n+2; \frac{b(e+fx)}{be-af}\right)}{b(n+1)(bc-ad)(be-af)} + \frac{c^2(e+fx)^{n+1} {}_2F_1\left(1, n+1; n+2; \frac{d(e+fx)}{de-cf}\right)}{d(n+1)(bc-ad)(de-cf)} + \frac{(e+fx)^{n+1}}{bdf(n+1)}$$

[Out] (e + f*x)^(1 + n)/(b*d*f*(1 + n)) - (a^2*(e + f*x)^(1 + n)*Hypergeometric2F1[1, 1 + n, 2 + n, (b*(e + f*x))/(b*e - a*f)]/(b*(b*c - a*d)*(b*e - a*f)*(1 + n)) + (c^2*(e + f*x)^(1 + n)*Hypergeometric2F1[1, 1 + n, 2 + n, (d*(e + f*x))/(d*e - c*f)]/(d*(b*c - a*d)*(d*e - c*f)*(1 + n))

Rubi [A] time = 0.107468, antiderivative size = 158, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 2, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.08$, Rules used = {180, 68}

$$-\frac{a^2(e+fx)^{n+1} {}_2F_1\left(1, n+1; n+2; \frac{b(e+fx)}{be-af}\right)}{b(n+1)(bc-ad)(be-af)} + \frac{c^2(e+fx)^{n+1} {}_2F_1\left(1, n+1; n+2; \frac{d(e+fx)}{de-cf}\right)}{d(n+1)(bc-ad)(de-cf)} + \frac{(e+fx)^{n+1}}{bdf(n+1)}$$

Antiderivative was successfully verified.

[In] Int[(x^2*(e + f*x)^n)/((a + b*x)*(c + d*x)), x]

[Out] (e + f*x)^(1 + n)/(b*d*f*(1 + n)) - (a^2*(e + f*x)^(1 + n)*Hypergeometric2F1[1, 1 + n, 2 + n, (b*(e + f*x))/(b*e - a*f)]/(b*(b*c - a*d)*(b*e - a*f)*(1 + n)) + (c^2*(e + f*x)^(1 + n)*Hypergeometric2F1[1, 1 + n, 2 + n, (d*(e + f*x))/(d*e - c*f)]/(d*(b*c - a*d)*(d*e - c*f)*(1 + n))

Rule 180

Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_)*((e_.) + (f_.)*(x_))^(p_)*((g_.) + (h_.)*(x_))^(q_), x_Symbol] := Int[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n*(e + f*x)^p*(g + h*x)^q, x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n}, x] && IntegersQ[p, q]

Rule 68

Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] := Simp[((b*c - a*d)^n*(a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a + b*x))/(b*c - a*d))]/(b^(n + 1)*(m + 1)), x] /; FreeQ[{a, b, c, d, m}, x]

$\&\& \text{NeQ}[b*c - a*d, 0] \&\& \text{IntegerQ}[m] \&\& \text{IntegerQ}[n]$

Rubi steps

$$\begin{aligned} \int \frac{x^2(e+fx)^n}{(a+bx)(c+dx)} dx &= \int \left(\frac{(e+fx)^n}{bd} + \frac{a^2(e+fx)^n}{b(bc-ad)(a+bx)} + \frac{c^2(e+fx)^n}{d(-bc+ad)(c+dx)} \right) dx \\ &= \frac{(e+fx)^{1+n}}{bdf(1+n)} + \frac{a^2 \int \frac{(e+fx)^n}{a+bx} dx}{b(bc-ad)} - \frac{c^2 \int \frac{(e+fx)^n}{c+dx} dx}{d(bc-ad)} \\ &= \frac{(e+fx)^{1+n}}{bdf(1+n)} - \frac{a^2(e+fx)^{1+n} {}_2F_1\left(1, 1+n; 2+n; \frac{b(e+fx)}{be-af}\right)}{b(bc-ad)(be-af)(1+n)} + \frac{c^2(e+fx)^{1+n} {}_2F_1\left(1, 1+n; 2+n; \frac{d(e+fx)}{de-cf}\right)}{d(bc-ad)(de-cf)(1+n)} \end{aligned}$$

Mathematica [A] time = 0.0740055, size = 153, normalized size = 0.97

$$\frac{(e+fx)^{n+1} \left(a^2 df (cf-de) {}_2F_1\left(1, n+1; n+2; \frac{b(e+fx)}{be-af}\right) + (be-af) \left(bc^2 f {}_2F_1\left(1, n+1; n+2; \frac{d(e+fx)}{de-cf}\right) - (bc-ad)(cf-de) \right) \right)}{bdf(n+1)(bc-ad)(be-af)(de-cf)}$$

Antiderivative was successfully verified.

[In] Integrate[(x^2*(e+f*x)^n)/((a+b*x)*(c+d*x)),x]

[Out] ((e+f*x)^(1+n)*(a^2*d*f*(-(d*e)+c*f)*Hypergeometric2F1[1, 1+n, 2+n, (b*(e+f*x))/(b*e-a*f)] + (b*e-a*f)*(-(b*c-a*d)*(-(d*e)+c*f)) + b*c^2*f*Hypergeometric2F1[1, 1+n, 2+n, (d*(e+f*x))/(d*e-c*f)]))/ (b*d*(b*c-a*d)*f*(b*e-a*f)*(d*e-c*f)*(1+n))

Maple [F] time = 0.069, size = 0, normalized size = 0.

$$\int \frac{(fx+e)^n x^2}{(bx+a)(dx+c)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(x^2*(f*x+e)^n/(b*x+a)/(d*x+c),x)

[Out] int(x^2*(f*x+e)^n/(b*x+a)/(d*x+c),x)

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(fx + e)^n x^2}{(bx + a)(dx + c)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^2*(f*x+e)^n/(b*x+a)/(d*x+c),x, algorithm="maxima")

[Out] integrate((f*x + e)^n*x^2/((b*x + a)*(d*x + c)), x)

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{(fx + e)^n x^2}{bdx^2 + ac + (bc + ad)x}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^2*(f*x+e)^n/(b*x+a)/(d*x+c),x, algorithm="fricas")

[Out] integral((f*x + e)^n*x^2/(b*d*x^2 + a*c + (b*c + a*d)*x), x)

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x**2*(f*x+e)**n/(b*x+a)/(d*x+c),x)

[Out] Timed out

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(fx + e)^n x^2}{(bx + a)(dx + c)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(f*x+e)^n/(b*x+a)/(d*x+c),x, algorithm="giac")
```

```
[Out] integrate((f*x + e)^n*x^2/((b*x + a)*(d*x + c)), x)
```


$$3.115 \quad \int \frac{x(e+fx)^n}{(a+bx)(c+dx)} dx$$

Optimal. Leaf size=124

$$\frac{a(e+fx)^{n+1} {}_2F_1\left(1, n+1; n+2; \frac{b(e+fx)}{be-af}\right)}{(n+1)(bc-ad)(be-af)} - \frac{c(e+fx)^{n+1} {}_2F_1\left(1, n+1; n+2; \frac{d(e+fx)}{de-cf}\right)}{(n+1)(bc-ad)(de-cf)}$$

[Out] (a*(e + f*x)^(1 + n)*Hypergeometric2F1[1, 1 + n, 2 + n, (b*(e + f*x))/(b*e - a*f)]/((b*c - a*d)*(b*e - a*f)*(1 + n)) - (c*(e + f*x)^(1 + n)*Hypergeometric2F1[1, 1 + n, 2 + n, (d*(e + f*x))/(d*e - c*f)]/((b*c - a*d)*(d*e - c*f)*(1 + n))

Rubi [A] time = 0.0385097, antiderivative size = 124, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.087$, Rules used = {156, 68}

$$\frac{a(e+fx)^{n+1} {}_2F_1\left(1, n+1; n+2; \frac{b(e+fx)}{be-af}\right)}{(n+1)(bc-ad)(be-af)} - \frac{c(e+fx)^{n+1} {}_2F_1\left(1, n+1; n+2; \frac{d(e+fx)}{de-cf}\right)}{(n+1)(bc-ad)(de-cf)}$$

Antiderivative was successfully verified.

[In] Int[(x*(e + f*x)^n)/((a + b*x)*(c + d*x)), x]

[Out] (a*(e + f*x)^(1 + n)*Hypergeometric2F1[1, 1 + n, 2 + n, (b*(e + f*x))/(b*e - a*f)]/((b*c - a*d)*(b*e - a*f)*(1 + n)) - (c*(e + f*x)^(1 + n)*Hypergeometric2F1[1, 1 + n, 2 + n, (d*(e + f*x))/(d*e - c*f)]/((b*c - a*d)*(d*e - c*f)*(1 + n))

Rule 156

Int[(((e_.) + (f_.)*(x_))^(p_)*((g_.) + (h_.)*(x_)))/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[(b*g - a*h)/(b*c - a*d), Int[(e + f*x)^p/(a + b*x), x], x] - Dist[(d*g - c*h)/(b*c - a*d), Int[(e + f*x)^p/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x]

Rule 68

Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((b*c - a*d)^n*(a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a + b*x))/(b*c - a*d))]/(b^(n + 1)*(m + 1)), x] /; FreeQ[{a, b, c, d, m}, x]

$\&\& \text{NeQ}[b*c - a*d, 0] \&\& !\text{IntegerQ}[m] \&\& \text{IntegerQ}[n]$

Rubi steps

$$\int \frac{x(e+fx)^n}{(a+bx)(c+dx)} dx = -\frac{a \int \frac{(e+fx)^n}{a+bx} dx}{bc-ad} + \frac{c \int \frac{(e+fx)^n}{c+dx} dx}{bc-ad}$$

$$= \frac{a(e+fx)^{1+n} {}_2F_1\left(1, 1+n; 2+n; \frac{b(e+fx)}{be-af}\right)}{(bc-ad)(be-af)(1+n)} - \frac{c(e+fx)^{1+n} {}_2F_1\left(1, 1+n; 2+n; \frac{d(e+fx)}{de-cf}\right)}{(bc-ad)(de-cf)(1+n)}$$

Mathematica [A] time = 0.0262487, size = 116, normalized size = 0.94

$$\frac{(e+fx)^{n+1} \left(a(cf-de) {}_2F_1\left(1, n+1; n+2; \frac{b(e+fx)}{be-af}\right) + c(be-af) {}_2F_1\left(1, n+1; n+2; \frac{d(e+fx)}{de-cf}\right) \right)}{(n+1)(bc-ad)(be-af)(cf-de)}$$

Antiderivative was successfully verified.

[In] Integrate[(x*(e + f*x)^n)/((a + b*x)*(c + d*x)), x]

[Out] ((e + f*x)^(1 + n)*(a*(-(d*e) + c*f)*Hypergeometric2F1[1, 1 + n, 2 + n, (b*(e + f*x))/(b*e - a*f)] + c*(b*e - a*f)*Hypergeometric2F1[1, 1 + n, 2 + n, (d*(e + f*x))/(d*e - c*f)]))/((b*c - a*d)*(b*e - a*f)*(-(d*e) + c*f)*(1 + n))

Maple [F] time = 0.068, size = 0, normalized size = 0.

$$\int \frac{(fx+e)^n x}{(bx+a)(dx+c)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(x*(f*x+e)^n/(b*x+a)/(d*x+c), x)

[Out] int(x*(f*x+e)^n/(b*x+a)/(d*x+c), x)

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(fx + e)^n x}{(bx + a)(dx + c)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x*(f*x+e)^n/(b*x+a)/(d*x+c),x, algorithm="maxima")

[Out] integrate((f*x + e)^n*x/((b*x + a)*(d*x + c)), x)

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{(fx + e)^n x}{bdx^2 + ac + (bc + ad)x}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x*(f*x+e)^n/(b*x+a)/(d*x+c),x, algorithm="fricas")

[Out] integral((f*x + e)^n*x/(b*d*x^2 + a*c + (b*c + a*d)*x), x)

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x*(f*x+e)**n/(b*x+a)/(d*x+c),x)

[Out] Timed out

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(fx + e)^n x}{(bx + a)(dx + c)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(f*x+e)^n/(b*x+a)/(d*x+c),x, algorithm="giac")
```

```
[Out] integrate((f*x + e)^n*x/((b*x + a)*(d*x + c)), x)
```

$$3.116 \quad \int \frac{(e+fx)^n}{(a+bx)(c+dx)} dx$$

Optimal. Leaf size=124

$$\frac{d(e+fx)^{n+1} {}_2F_1\left(1, n+1; n+2; \frac{d(e+fx)}{de-cf}\right)}{(n+1)(bc-ad)(de-cf)} - \frac{b(e+fx)^{n+1} {}_2F_1\left(1, n+1; n+2; \frac{b(e+fx)}{be-af}\right)}{(n+1)(bc-ad)(be-af)}$$

[Out] -((b*(e + f*x)^(1 + n)*Hypergeometric2F1[1, 1 + n, 2 + n, (b*(e + f*x))/(b*e - a*f)])/((b*c - a*d)*(b*e - a*f)*(1 + n))) + (d*(e + f*x)^(1 + n)*Hypergeometric2F1[1, 1 + n, 2 + n, (d*(e + f*x))/(d*e - c*f)])/((b*c - a*d)*(d*e - c*f)*(1 + n))

Rubi [A] time = 0.0331753, antiderivative size = 124, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$, Rules used = {86, 68}

$$\frac{d(e+fx)^{n+1} {}_2F_1\left(1, n+1; n+2; \frac{d(e+fx)}{de-cf}\right)}{(n+1)(bc-ad)(de-cf)} - \frac{b(e+fx)^{n+1} {}_2F_1\left(1, n+1; n+2; \frac{b(e+fx)}{be-af}\right)}{(n+1)(bc-ad)(be-af)}$$

Antiderivative was successfully verified.

[In] Int[(e + f*x)^n/((a + b*x)*(c + d*x)), x]

[Out] -((b*(e + f*x)^(1 + n)*Hypergeometric2F1[1, 1 + n, 2 + n, (b*(e + f*x))/(b*e - a*f)])/((b*c - a*d)*(b*e - a*f)*(1 + n))) + (d*(e + f*x)^(1 + n)*Hypergeometric2F1[1, 1 + n, 2 + n, (d*(e + f*x))/(d*e - c*f)])/((b*c - a*d)*(d*e - c*f)*(1 + n))

Rule 86

Int[((e_.) + (f_.)*(x_))^(p_)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] := Dist[b/(b*c - a*d), Int[(e + f*x)^p/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[(e + f*x)^p/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p}, x] && !IntegerQ[p]

Rule 68

Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] := Simp[(((b*c - a*d)^n*(a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a + b*x))/(b*c - a*d))])/(b^(n + 1)*(m + 1)), x] /; FreeQ[{a, b, c, d, m}, x]

`&& NeQ[b*c - a*d, 0] && !IntegerQ[m] && IntegerQ[n]`

Rubi steps

$$\int \frac{(e+fx)^n}{(a+bx)(c+dx)} dx = \frac{b \int \frac{(e+fx)^n}{a+bx} dx}{bc-ad} - \frac{d \int \frac{(e+fx)^n}{c+dx} dx}{bc-ad}$$

$$= -\frac{b(e+fx)^{1+n} {}_2F_1\left(1, 1+n; 2+n; \frac{b(e+fx)}{be-af}\right)}{(bc-ad)(be-af)(1+n)} + \frac{d(e+fx)^{1+n} {}_2F_1\left(1, 1+n; 2+n; \frac{d(e+fx)}{de-cf}\right)}{(bc-ad)(de-cf)(1+n)}$$

Mathematica [A] time = 0.0297939, size = 116, normalized size = 0.94

$$\frac{(e+fx)^{n+1} \left(b(de-cf) {}_2F_1\left(1, n+1; n+2; \frac{b(e+fx)}{be-af}\right) + d(af-be) {}_2F_1\left(1, n+1; n+2; \frac{d(e+fx)}{de-cf}\right) \right)}{(n+1)(bc-ad)(be-af)(cf-de)}$$

Antiderivative was successfully verified.

[In] Integrate[(e + f*x)^n/((a + b*x)*(c + d*x)), x]

[Out] ((e + f*x)^(1 + n)*(b*(d*e - c*f)*Hypergeometric2F1[1, 1 + n, 2 + n, (b*(e + f*x))/(b*e - a*f)] + d*(-(b*e) + a*f)*Hypergeometric2F1[1, 1 + n, 2 + n, (d*(e + f*x))/(d*e - c*f)])/((b*c - a*d)*(b*e - a*f)*(-(d*e) + c*f)*(1 + n))

Maple [F] time = 0.063, size = 0, normalized size = 0.

$$\int \frac{(fx+e)^n}{(bx+a)(dx+c)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((f*x+e)^n/(b*x+a)/(d*x+c), x)

[Out] int((f*x+e)^n/(b*x+a)/(d*x+c), x)

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(fx + e)^n}{(bx + a)(dx + c)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((f*x+e)^n/(b*x+a)/(d*x+c),x, algorithm="maxima")

[Out] integrate((f*x + e)^n/((b*x + a)*(d*x + c)), x)

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{(fx + e)^n}{bdx^2 + ac + (bc + ad)x}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((f*x+e)^n/(b*x+a)/(d*x+c),x, algorithm="fricas")

[Out] integral((f*x + e)^n/(b*d*x^2 + a*c + (b*c + a*d)*x), x)

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((f*x+e)**n/(b*x+a)/(d*x+c),x)

[Out] Timed out

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(fx + e)^n}{(bx + a)(dx + c)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)^n/(b*x+a)/(d*x+c),x, algorithm="giac")
```

```
[Out] integrate((f*x + e)^n/((b*x + a)*(d*x + c)), x)
```


$$3.117 \quad \int \frac{(e+fx)^n}{x(a+bx)(c+dx)} dx$$

Optimal. Leaf size=175

$$\frac{b^2(e+fx)^{n+1} {}_2F_1\left(1, n+1; n+2; \frac{b(e+fx)}{be-af}\right)}{a(n+1)(bc-ad)(be-af)} - \frac{d^2(e+fx)^{n+1} {}_2F_1\left(1, n+1; n+2; \frac{d(e+fx)}{de-cf}\right)}{c(n+1)(bc-ad)(de-cf)} - \frac{(e+fx)^{n+1} {}_2F_1\left(1, n+1; n+2; \frac{e+fx}{e}\right)}{ace(n+1)}$$

[Out] (b^2*(e + f*x)^(1 + n)*Hypergeometric2F1[1, 1 + n, 2 + n, (b*(e + f*x))/(b*e - a*f)]/(a*(b*c - a*d)*(b*e - a*f)*(1 + n)) - (d^2*(e + f*x)^(1 + n)*Hypergeometric2F1[1, 1 + n, 2 + n, (d*(e + f*x))/(d*e - c*f)]/(c*(b*c - a*d)*(d*e - c*f)*(1 + n)) - ((e + f*x)^(1 + n)*Hypergeometric2F1[1, 1 + n, 2 + n, 1 + (f*x)/e])/(a*c*e*(1 + n))

Rubi [A] time = 0.119487, antiderivative size = 175, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 3, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.12$, Rules used = {180, 65, 68}

$$\frac{b^2(e+fx)^{n+1} {}_2F_1\left(1, n+1; n+2; \frac{b(e+fx)}{be-af}\right)}{a(n+1)(bc-ad)(be-af)} - \frac{d^2(e+fx)^{n+1} {}_2F_1\left(1, n+1; n+2; \frac{d(e+fx)}{de-cf}\right)}{c(n+1)(bc-ad)(de-cf)} - \frac{(e+fx)^{n+1} {}_2F_1\left(1, n+1; n+2; \frac{e+fx}{e}\right)}{ace(n+1)}$$

Antiderivative was successfully verified.

[In] Int[(e + f*x)^n/(x*(a + b*x)*(c + d*x)), x]

[Out] (b^2*(e + f*x)^(1 + n)*Hypergeometric2F1[1, 1 + n, 2 + n, (b*(e + f*x))/(b*e - a*f)]/(a*(b*c - a*d)*(b*e - a*f)*(1 + n)) - (d^2*(e + f*x)^(1 + n)*Hypergeometric2F1[1, 1 + n, 2 + n, (d*(e + f*x))/(d*e - c*f)]/(c*(b*c - a*d)*(d*e - c*f)*(1 + n)) - ((e + f*x)^(1 + n)*Hypergeometric2F1[1, 1 + n, 2 + n, 1 + (f*x)/e])/(a*c*e*(1 + n))

Rule 180

Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_)*((e_.) + (f_.)*(x_))^(p_)*((g_.) + (h_.)*(x_))^(q_), x_Symbol] := Int[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n*(e + f*x)^p*(g + h*x)^q, x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n}, x] && IntegersQ[p, q]

Rule 65

Int[((b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] := Simp[((c + d*x)^(n + 1)*Hypergeometric2F1[-m, n + 1, n + 2, 1 + (d*x)/c])/(d*(n + 1)*(-(d

$(b*c)^m, x] /; \text{FreeQ}\{b, c, d, m, n\}, x] \&\& \text{!IntegerQ}[n] \&\& (\text{IntegerQ}[m] \mid\mid \text{GtQ}[-(d/(b*c)), 0])$

Rule 68

$\text{Int}[(a_ + (b_ \cdot x_)^m) \cdot (c_ + (d_ \cdot x_)^n), x_Symbol] :> \text{Simp}[(b*c - a*d)^n \cdot (a + b*x)^{m+1} \cdot \text{Hypergeometric2F1}[-n, m+1, m+2, -(d*(a + b*x)/(b*c - a*d))]/(b^{n+1} \cdot (m+1)), x] /; \text{FreeQ}\{a, b, c, d, m\}, x] \&\& \text{NeQ}[b*c - a*d, 0] \&\& \text{!IntegerQ}[m] \&\& \text{IntegerQ}[n]$

Rubi steps

$$\begin{aligned} \int \frac{(e+fx)^n}{x(a+bx)(c+dx)} dx &= \int \left(\frac{(e+fx)^n}{acx} + \frac{b^2(e+fx)^n}{a(-bc+ad)(a+bx)} + \frac{d^2(e+fx)^n}{c(bc-ad)(c+dx)} \right) dx \\ &= \frac{\int \frac{(e+fx)^n}{x} dx}{ac} - \frac{b^2 \int \frac{(e+fx)^n}{a+bx} dx}{a(bc-ad)} + \frac{d^2 \int \frac{(e+fx)^n}{c+dx} dx}{c(bc-ad)} \\ &= \frac{b^2(e+fx)^{1+n} {}_2F_1\left(1, 1+n; 2+n; \frac{b(e+fx)}{be-af}\right)}{a(bc-ad)(be-af)(1+n)} - \frac{d^2(e+fx)^{1+n} {}_2F_1\left(1, 1+n; 2+n; \frac{d(e+fx)}{de-cf}\right)}{c(bc-ad)(de-cf)(1+n)} - \frac{(e+fx)^{n+1}}{x} \end{aligned}$$

Mathematica [A] time = 0.183661, size = 170, normalized size = 0.97

$$\frac{(e+fx)^{n+1} \left(b^2ce(de-cf) {}_2F_1\left(1, n+1; n+2; \frac{b(e+fx)}{be-af}\right) + (af-be) \left(ad^2e {}_2F_1\left(1, n+1; n+2; \frac{d(e+fx)}{de-cf}\right) - (bc-ad)(cf-de) \right) \right)}{ace(n+1)(ad-bc)(af-be)(cf-de)}$$

Antiderivative was successfully verified.

[In] Integrate[(e + f*x)^n/(x*(a + b*x)*(c + d*x)),x]

[Out] -(((e + f*x)^(1 + n)*(b^2*c*e*(d*e - c*f)*Hypergeometric2F1[1, 1 + n, 2 + n, (b*(e + f*x))/(b*e - a*f)] + (-b*e) + a*f)*(a*d^2*e*Hypergeometric2F1[1, 1 + n, 2 + n, (d*(e + f*x))/(d*e - c*f)] - (b*c - a*d)*(-(d*e) + c*f)*Hypergeometric2F1[1, 1 + n, 2 + n, 1 + (f*x)/e]))/(a*c*(-(b*c) + a*d)*e*(-(b*e) + a*f)*(-(d*e) + c*f)*(1 + n)))

Maple [F] time = 0.052, size = 0, normalized size = 0.

$$\int \frac{(fx+e)^n}{x(bx+a)(dx+c)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `int((f*x+e)^n/x/(b*x+a)/(d*x+c),x)`

[Out] `int((f*x+e)^n/x/(b*x+a)/(d*x+c),x)`

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(fx + e)^n}{(bx + a)(dx + c)x} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((f*x+e)^n/x/(b*x+a)/(d*x+c),x, algorithm="maxima")`

[Out] `integrate((f*x + e)^n/((b*x + a)*(d*x + c)*x), x)`

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{(fx + e)^n}{bdx^3 + acx + (bc + ad)x^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((f*x+e)^n/x/(b*x+a)/(d*x+c),x, algorithm="fricas")`

[Out] `integral((f*x + e)^n/(b*d*x^3 + a*c*x + (b*c + a*d)*x^2), x)`

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((f*x+e)**n/x/(b*x+a)/(d*x+c),x)`

[Out] Timed out

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(fx + e)^n}{(bx + a)(dx + c)x} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((f*x+e)^n/x/(b*x+a)/(d*x+c),x, algorithm="giac")

[Out] integrate((f*x + e)^n/((b*x + a)*(d*x + c)*x), x)

$$3.118 \quad \int \frac{(e+fx)^n}{x^2(a+bx)(c+dx)} dx$$

Optimal. Leaf size=222

$$\frac{b^3(e+fx)^{n+1} {}_2F_1\left(1, n+1; n+2; \frac{b(e+fx)}{be-af}\right)}{a^2(n+1)(bc-ad)(be-af)} + \frac{(ad+bc)(e+fx)^{n+1} {}_2F_1\left(1, n+1; n+2; \frac{fx}{e} + 1\right)}{a^2c^2e(n+1)} + \frac{d^3(e+fx)^{n+1} {}_2F_1\left(1, n+1; n+2; \frac{fx}{e} + 1\right)}{c^2(n+1)(bc-ad)}$$

[Out] $-\left(\frac{b^3(e+fx)^{1+n} \text{Hypergeometric2F1}[1, 1+n, 2+n, (b*(e+fx))/(b*e-a*f)]}{a^2*(b*c-a*d)*(b*e-a*f)*(1+n)} + \frac{d^3(e+fx)^{1+n} \text{Hypergeometric2F1}[1, 1+n, 2+n, (d*(e+fx))/(d*e-c*f)]}{c^2*(b*c-a*d)*(d*e-c*f)*(1+n)} + \frac{(b*c+a*d)*(e+fx)^{1+n} \text{Hypergeometric2F1}[1, 1+n, 2+n, 1+(f*x)/e]}{a^2*c^2*e*(1+n)} + \frac{f*(e+fx)^{1+n} \text{Hypergeometric2F1}[2, 1+n, 2+n, 1+(f*x)/e]}{a*c*e^2*(1+n)}\right)$

Rubi [A] time = 0.151256, antiderivative size = 222, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 3, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.12$, Rules used = {180, 65, 68}

$$\frac{b^3(e+fx)^{n+1} {}_2F_1\left(1, n+1; n+2; \frac{b(e+fx)}{be-af}\right)}{a^2(n+1)(bc-ad)(be-af)} + \frac{(ad+bc)(e+fx)^{n+1} {}_2F_1\left(1, n+1; n+2; \frac{fx}{e} + 1\right)}{a^2c^2e(n+1)} + \frac{d^3(e+fx)^{n+1} {}_2F_1\left(1, n+1; n+2; \frac{fx}{e} + 1\right)}{c^2(n+1)(bc-ad)}$$

Antiderivative was successfully verified.

[In] Int[(e + f*x)^n/(x^2*(a + b*x)*(c + d*x)), x]

[Out] $-\left(\frac{b^3(e+fx)^{1+n} \text{Hypergeometric2F1}[1, 1+n, 2+n, (b*(e+fx))/(b*e-a*f)]}{a^2*(b*c-a*d)*(b*e-a*f)*(1+n)} + \frac{d^3(e+fx)^{1+n} \text{Hypergeometric2F1}[1, 1+n, 2+n, (d*(e+fx))/(d*e-c*f)]}{c^2*(b*c-a*d)*(d*e-c*f)*(1+n)} + \frac{(b*c+a*d)*(e+fx)^{1+n} \text{Hypergeometric2F1}[1, 1+n, 2+n, 1+(f*x)/e]}{a^2*c^2*e*(1+n)} + \frac{f*(e+fx)^{1+n} \text{Hypergeometric2F1}[2, 1+n, 2+n, 1+(f*x)/e]}{a*c*e^2*(1+n)}\right)$

Rule 180

Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_)*((e_.) + (f_.)*(x_))^(p_)*((g_.) + (h_.)*(x_))^(q_), x_Symbol] := Int[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n*(e + f*x)^p*(g + h*x)^q, x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n}, x] && IntegersQ[p, q]

Rule 65

```
Int[((b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] := Simp[((c + d*x)^(n + 1)*Hypergeometric2F1[-m, n + 1, n + 2, 1 + (d*x)/c])/(d*(n + 1)*(-(d/(b*c)))^m), x] /; FreeQ[{b, c, d, m, n}, x] && !IntegerQ[n] && (IntegerQ[m] || GtQ[-(d/(b*c)), 0])
```

Rule 68

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] := Simp[((b*c - a*d)^n*(a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a + b*x))/(b*c - a*d))])/(b^(n + 1)*(m + 1)), x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[b*c - a*d, 0] && !IntegerQ[m] && IntegerQ[n]
```

Rubi steps

$$\begin{aligned} \int \frac{(e+fx)^n}{x^2(a+bx)(c+dx)} dx &= \int \left(\frac{(e+fx)^n}{acx^2} + \frac{(-bc-ad)(e+fx)^n}{a^2c^2x} - \frac{b^3(e+fx)^n}{a^2(-bc+ad)(a+bx)} - \frac{d^3(e+fx)^n}{c^2(bc-ad)(c+dx)} \right) dx \\ &= \frac{\int \frac{(e+fx)^n}{x^2} dx}{ac} + \frac{b^3 \int \frac{(e+fx)^n}{a+bx} dx}{a^2(bc-ad)} - \frac{d^3 \int \frac{(e+fx)^n}{c+dx} dx}{c^2(bc-ad)} - \frac{(bc+ad) \int \frac{(e+fx)^n}{x} dx}{a^2c^2} \\ &= -\frac{b^3(e+fx)^{1+n} {}_2F_1\left(1, 1+n; 2+n; \frac{b(e+fx)}{be-af}\right)}{a^2(bc-ad)(be-af)(1+n)} + \frac{d^3(e+fx)^{1+n} {}_2F_1\left(1, 1+n; 2+n; \frac{d(e+fx)}{de-cf}\right)}{c^2(bc-ad)(de-cf)(1+n)} + \dots \end{aligned}$$

Mathematica [A] time = 0.267072, size = 177, normalized size = 0.8

$$\frac{(e+fx)^{n+1} \left(\frac{e(ad+bc) {}_2F_1\left(1, n+1, n+2; \frac{fx}{e}+1\right) + acf {}_2F_1\left(2, n+1, n+2; \frac{fx}{e}+1\right)}{a^2e^2} - \frac{d^3 {}_2F_1\left(1, n+1, n+2; \frac{d(e+fx)}{de-cf}\right)}{(bc-ad)(cf-de)} - \frac{b^3 {}_2F_1\left(1, n+1, n+2; \frac{b(e+fx)}{be-af}\right)}{a^2(bc-ad)(be-af)} \right)}{n+1}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e + f*x)^n/(x^2*(a + b*x)*(c + d*x)), x]
```

```
[Out] ((e + f*x)^(1 + n)*(-(b^3*Hypergeometric2F1[1, 1 + n, 2 + n, (b*(e + f*x))/(b*e - a*f)])/(a^2*(b*c - a*d)*(b*e - a*f))) + (-(d^3*Hypergeometric2F1[1, 1 + n, 2 + n, (d*(e + f*x))/(d*e - c*f)])/((b*c - a*d)*(-(d*e) + c*f))) + ((b*c + a*d)*e*Hypergeometric2F1[1, 1 + n, 2 + n, 1 + (f*x)/e] + a*c*f*Hypergeometric2F1[2, 1 + n, 2 + n, 1 + (f*x)/e])/(a^2*e^2)/c^2)/(1 + n)
```

Maple [F] time = 0.082, size = 0, normalized size = 0.

$$\int \frac{(fx + e)^n}{x^2 (bx + a)(dx + c)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((f*x+e)^n/x^2/(b*x+a)/(d*x+c), x)

[Out] int((f*x+e)^n/x^2/(b*x+a)/(d*x+c), x)

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(fx + e)^n}{(bx + a)(dx + c)x^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((f*x+e)^n/x^2/(b*x+a)/(d*x+c), x, algorithm="maxima")

[Out] integrate((f*x + e)^n/((b*x + a)*(d*x + c)*x^2), x)

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{(fx + e)^n}{bdx^4 + acx^2 + (bc + ad)x^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((f*x+e)^n/x^2/(b*x+a)/(d*x+c), x, algorithm="fricas")

[Out] integral((f*x + e)^n/(b*d*x^4 + a*c*x^2 + (b*c + a*d)*x^3), x)

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((f*x+e)**n/x**2/(b*x+a)/(d*x+c),x)`

[Out] Timed out

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(fx + e)^n}{(bx + a)(dx + c)x^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((f*x+e)^n/x^2/(b*x+a)/(d*x+c),x, algorithm="giac")`

[Out] `integrate((f*x + e)^n/((b*x + a)*(d*x + c)*x^2), x)`

3.119 $\int (a + bx)^m (c + dx)(e + fx)(g + hx) dx$

Optimal. Leaf size=167

$$\frac{(a + bx)^{m+2} (3a^2dfh - 2ab(cf h + deh + dfg) + b^2(ceh + cfg + deg))}{b^4(m+2)} + \frac{(bc - ad)(be - af)(bg - ah)(a + bx)^{m+1}}{b^4(m+1)} - \frac{(a + bx)^{m+1}}{b^4(m+1)}$$

[Out] $((b*c - a*d)*(b*e - a*f)*(b*g - a*h)*(a + b*x)^{(1 + m)})/(b^4*(1 + m)) + ((3*a^2*d*f*h + b^2*(d*e*g + c*f*g + c*e*h) - 2*a*b*(d*f*g + d*e*h + c*f*h))*(a + b*x)^{(2 + m)})/(b^4*(2 + m)) - ((3*a*d*f*h - b*(d*f*g + d*e*h + c*f*h))*(a + b*x)^{(3 + m)})/(b^4*(3 + m)) + (d*f*h*(a + b*x)^{(4 + m)})/(b^4*(4 + m))$

Rubi [A] time = 0.130565, antiderivative size = 167, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.043$, Rules used = {142}

$$\frac{(a + bx)^{m+2} (3a^2dfh - 2ab(cf h + deh + dfg) + b^2(ceh + cfg + deg))}{b^4(m+2)} + \frac{(bc - ad)(be - af)(bg - ah)(a + bx)^{m+1}}{b^4(m+1)} - \frac{(a + bx)^{m+1}}{b^4(m+1)}$$

Antiderivative was successfully verified.

[In] $\text{Int}[(a + b*x)^m*(c + d*x)*(e + f*x)*(g + h*x), x]$

[Out] $((b*c - a*d)*(b*e - a*f)*(b*g - a*h)*(a + b*x)^{(1 + m)})/(b^4*(1 + m)) + ((3*a^2*d*f*h + b^2*(d*e*g + c*f*g + c*e*h) - 2*a*b*(d*f*g + d*e*h + c*f*h))*(a + b*x)^{(2 + m)})/(b^4*(2 + m)) - ((3*a*d*f*h - b*(d*f*g + d*e*h + c*f*h))*(a + b*x)^{(3 + m)})/(b^4*(3 + m)) + (d*f*h*(a + b*x)^{(4 + m)})/(b^4*(4 + m))$

Rule 142

$\text{Int}[(a + b*x)^m*(c + d*x)*(e + f*x)*(g + h*x), x] := \text{Int}[\text{ExpandIntegrand}[(a + b*x)^m*(c + d*x)^n*(e + f*x)*(g + h*x), x], x] /; \text{FreeQ}[\{a, b, c, d, e, f, g, h\}, x] \&\& (\text{IGtQ}[m, 0] \parallel \text{IntegersQ}[m, n])$

Rubi steps

$$\int (a+bx)^m(c+dx)(e+fx)(g+hx)dx = \int \left(\frac{(bc-ad)(be-af)(bg-ah)(a+bx)^m}{b^3} + \frac{(3a^2dfh + b^2(deg+cfg+ceh) - 2adfh)}{b^3} \right) dx$$

$$= \frac{(bc-ad)(be-af)(bg-ah)(a+bx)^{1+m}}{b^4(1+m)} + \frac{(3a^2dfh + b^2(deg+cfg+ceh) - 2adfh)(a+bx)^{m+1}}{b^4(2+m)}$$

Mathematica [A] time = 0.233434, size = 149, normalized size = 0.89

$$\frac{(a+bx)^{m+1} \left(\frac{(a+bx)(3a^2dfh - 2ab(cfg+deh+dfg) + b^2(ceh+cfg+deg))}{m+2} + \frac{(a+bx)^2(b(cfg+deh+dfg) - 3adfh)}{m+3} + \frac{(bc-ad)(be-af)(bg-ah)}{m+1} + \frac{dfh(a+bx)^3}{m+4} \right)}{b^4}$$

Antiderivative was successfully verified.

[In] Integrate[(a + b*x)^m*(c + d*x)*(e + f*x)*(g + h*x), x]

[Out] ((a + b*x)^(1 + m)*(((b*c - a*d)*(b*e - a*f)*(b*g - a*h))/(1 + m) + ((3*a^2*d*f*h + b^2*(d*e*g + c*f*g + c*e*h) - 2*a*b*(d*f*g + d*e*h + c*f*h))*(a + b*x))/(2 + m) + ((-3*a*d*f*h + b*(d*f*g + d*e*h + c*f*h))*(a + b*x)^2)/(3 + m) + (d*f*h*(a + b*x)^3)/(4 + m))/b^4

Maple [B] time = 0.007, size = 726, normalized size = 4.4

$$\frac{(bx+a)^{1+m} \left(-b^3dfhm^3x^3 - b^3cfhm^3x^2 - b^3dehm^3x^2 - b^3dfgm^3x^2 - 6b^3dfhm^2x^3 + 3ab^2dfhm^2x^2 - b^3cehm^3x - b^3cfhm^3 \right)}{b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b*x+a)^m*(d*x+c)*(f*x+e)*(h*x+g), x)

[Out] -(b*x+a)^(1+m)*(-b^3*d*f*h*m^3*x^3-b^3*c*f*h*m^3*x^2-b^3*d*e*h*m^3*x^2-b^3*d*f*g*m^3*x^2-6*b^3*d*f*h*m^2*x^3+3*a*b^2*d*f*h*m^2*x^2-b^3*c*e*h*m^3*x-b^3*c*f*g*m^3*x-7*b^3*c*f*h*m^2*x^2-b^3*d*e*g*m^3*x-7*b^3*d*e*h*m^2*x^2-7*b^3*d*f*g*m^2*x^2-11*b^3*d*f*h*m*x^3+2*a*b^2*c*f*h*m^2*x+2*a*b^2*d*e*h*m^2*x+2*a*b^2*d*f*g*m^2*x+9*a*b^2*d*f*h*m*x^2-b^3*c*e*g*m^3-8*b^3*c*e*h*m^2*x-8*b^3*c*f*g*m^2*x-14*b^3*c*f*h*m*x^2-8*b^3*d*e*g*m^2*x-14*b^3*d*e*h*m*x^2-14*b^3*d*f*g*m*x^2-6*b^3*d*f*h*x^3-6*a^2*b*d*f*h*m*x+a*b^2*c*e*h*m^2+a*b^2*c*f*g*m^2+10*a*b^2*c*f*h*m*x+a*b^2*d*e*g*m^2+10*a*b^2*d*e*h*m*x+10*a*b^2*d*f*g*m^2)

$$\frac{x+6ab^2dfhx^2-9b^3c*egm^2-19b^3c*ehmx-19b^3c*f*gm*x-8b^3c*f*hx^2-19b^3d*egm*x-8b^3d*ehmx^2-8b^3d*f*gx^2-2a^2b*c*f*hm-2a^2b*d*ehm-2a^2b*d*f*gm-6a^2b*d*f*hx+7ab^2c*ehm+7ab^2c*f*gm+8ab^2c*f*hx+7ab^2d*egm+8ab^2d*ehx+8ab^2d*f*gx-26b^3c*egm-12b^3c*ehx-12b^3c*f*gx-12b^3d*egx+6a^3d*f*h-8a^2b*c*f*h-8a^2b*d*eh-8a^2b*d*f*g+12ab^2c*eh+12ab^2c*f*g+12ab^2d*eg-24b^3c*eg)/b^4/(m^4+10m^3+35m^2+50m+24)$$

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b*x+a)^m*(d*x+c)*(f*x+e)*(h*x+g),x, algorithm="maxima")

[Out] Exception raised: ValueError

Fricas [B] time = 1.60691, size = 1847, normalized size = 11.06

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b*x+a)^m*(d*x+c)*(f*x+e)*(h*x+g),x, algorithm="fricas")

[Out] $(a^3b^3c*egm^3 + (b^4d*f*hm^3 + 6b^4d*f*hm^2 + 11b^4d*f*hm + 6b^4d*f*h)*x^4 + (8b^4d*f*g + (b^4d*f*g + (b^4d*e + (b^4c + a*b^3d)*f)*h)*m^3 + (7b^4d*f*g + (7b^4d*e + (7b^4c + 3a*b^3d)*f)*h)*m^2 + 8*(b^4d*e + b^4c*f)*h + 2*(7b^4d*f*g + (7b^4d*e + (7b^4c + a*b^3d)*f)*h)*m)*x^3 - (a^2b^2c*eh + (a^2b^2c*f - (9a*b^3c - a^2b^2d)*e)*g)*m^2 + (12b^4c*eh + ((b^4d*e + (b^4c + a*b^3d)*f)*g + (a*b^3c*f + (b^4c + a*b^3d)*e)*h)*m^3 + ((8b^4d*e + (8b^4c + 5a*b^3d)*f)*g + ((8b^4c + 5a*b^3d)*e + (5a*b^3c - 3a^2b^2d)*f)*h)*m^2 + 12*(b^4d*e + b^4c*f)*g + ((19b^4d*e + (19b^4c + 4a*b^3d)*f)*g + ((19b^4c + 4a*b^3d)*e + (4a*b^3c - 3a^2b^2d)*f)*h)*m)*x^2 + 4*(3*(2a*b^3c - a^2b^2d)*e - (3a^2b^2c - 2a^3b*d)*f)*g - 2*(2*(3a^2b^2c - 2a^3b*d)*e - (4a^3b*c - 3a^4d)*f)*h + (((26a*b^3c - 7a^2b^2d)*e - (7a^2b^2c - 2a^3b*d)*f)*g + (2a^3b*c*f - (7a^2b^2c - 2a^3b*d)*e)*h)*m + (24b^4c*eg + (a*b^3c*eh + (a*b^3c*f + (b^4c + a*b^3d)*e)*g)*m^3 + ((9$

$$*b^4*c + 7*a*b^3*d)*e + (7*a*b^3*c - 2*a^2*b^2*d)*f)*g - (2*a^2*b^2*c*f - (7*a*b^3*c - 2*a^2*b^2*d)*e)*h)*m^2 + 2*((13*b^4*c + 6*a*b^3*d)*e + 2*(3*a*b^3*c - 2*a^2*b^2*d)*f)*g + (2*(3*a*b^3*c - 2*a^2*b^2*d)*e - (4*a^2*b^2*c - 3*a^3*b*d)*f)*h)*m)*x*(b*x + a)^m/(b^4*m^4 + 10*b^4*m^3 + 35*b^4*m^2 + 50*b^4*m + 24*b^4)$$

Sympy [A] time = 7.09604, size = 8218, normalized size = 49.21

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b*x+a)**m*(d*x+c)*(f*x+e)*(h*x+g),x)

[Out] Piecewise((a**m*(c*e*g*x + c*e*h*x**2/2 + c*f*g*x**2/2 + c*f*h*x**3/3 + d*e*g*x**2/2 + d*e*h*x**3/3 + d*f*g*x**3/3 + d*f*h*x**4/4), Eq(b, 0)), (6*a**3*d*f*h*log(a/b + x)/(6*a**3*b**4 + 18*a**2*b**5*x + 18*a*b**6*x**2 + 6*b**7*x**3) + 11*a**3*d*f*h/(6*a**3*b**4 + 18*a**2*b**5*x + 18*a*b**6*x**2 + 6*b**7*x**3) - 2*a**2*b*c*f*h/(6*a**3*b**4 + 18*a**2*b**5*x + 18*a*b**6*x**2 + 6*b**7*x**3) - 2*a**2*b*d*e*h/(6*a**3*b**4 + 18*a**2*b**5*x + 18*a*b**6*x**2 + 6*b**7*x**3) - 2*a**2*b*d*f*g/(6*a**3*b**4 + 18*a**2*b**5*x + 18*a*b**6*x**2 + 6*b**7*x**3) + 18*a**2*b*d*f*h*x*log(a/b + x)/(6*a**3*b**4 + 18*a**2*b**5*x + 18*a*b**6*x**2 + 6*b**7*x**3) + 27*a**2*b*d*f*h*x/(6*a**3*b**4 + 18*a**2*b**5*x + 18*a*b**6*x**2 + 6*b**7*x**3) - a*b**2*c*e*h/(6*a**3*b**4 + 18*a**2*b**5*x + 18*a*b**6*x**2 + 6*b**7*x**3) - a*b**2*c*f*g/(6*a**3*b**4 + 18*a**2*b**5*x + 18*a*b**6*x**2 + 6*b**7*x**3) - 6*a*b**2*c*f*h*x/(6*a**3*b**4 + 18*a**2*b**5*x + 18*a*b**6*x**2 + 6*b**7*x**3) - a*b**2*d*e*g/(6*a**3*b**4 + 18*a**2*b**5*x + 18*a*b**6*x**2 + 6*b**7*x**3) - 6*a*b**2*d*f*g*x/(6*a**3*b**4 + 18*a**2*b**5*x + 18*a*b**6*x**2 + 6*b**7*x**3) + 18*a*b**2*d*f*h*x**2*log(a/b + x)/(6*a**3*b**4 + 18*a**2*b**5*x + 18*a*b**6*x**2 + 6*b**7*x**3) + 18*a*b**2*d*f*h*x**2/(6*a**3*b**4 + 18*a**2*b**5*x + 18*a*b**6*x**2 + 6*b**7*x**3) - 2*b**3*c*e*g/(6*a**3*b**4 + 18*a**2*b**5*x + 18*a*b**6*x**2 + 6*b**7*x**3) - 3*b**3*c*e*h*x/(6*a**3*b**4 + 18*a**2*b**5*x + 18*a*b**6*x**2 + 6*b**7*x**3) - 3*b**3*c*f*g*x/(6*a**3*b**4 + 18*a**2*b**5*x + 18*a*b**6*x**2 + 6*b**7*x**3) - 6*b**3*c*f*h*x**2/(6*a**3*b**4 + 18*a**2*b**5*x + 18*a*b**6*x**2 + 6*b**7*x**3) - 3*b**3*d*e*g*x/(6*a**3*b**4 + 18*a**2*b**5*x + 18*a*b**6*x**2 + 6*b**7*x**3) - 6*b**3*d*e*h*x**2/(6*a**3*b**4 + 18*a**2*b**5*x + 18*a*b**6*x**2 + 6*b**7*x**3) - 6*b**3*d*f*g*x**2/(6*a**3*b**4 + 18*a**2*b**5*x + 18*a*b**6*x**2 + 6*b**7*x**3) + 6*b**3*d*f*h*x**3*log(a/b + x)/(6*a**3*b**4 + 18*a**2*b**5*x + 18*a*b**6*x**2 + 6*b**7*x**3), Eq(m, -4)), (-6*a**4*d*f*h*log(a/b + x)/(2*a**3*b**4 + 4*a**2*b

$$\begin{aligned}
& **5*x + 2*a*b**6*x**2) - 3*a**4*d*f*h/(2*a**3*b**4 + 4*a**2*b**5*x + 2*a*b**6*x**2) + 2*a**3*b*c*f*h*\log(a/b + x)/(2*a**3*b**4 + 4*a**2*b**5*x + 2*a*b**6*x**2) + a**3*b*c*f*h/(2*a**3*b**4 + 4*a**2*b**5*x + 2*a*b**6*x**2) + 2*a**3*b*d*e*h*\log(a/b + x)/(2*a**3*b**4 + 4*a**2*b**5*x + 2*a*b**6*x**2) + a**3*b*d*e*h/(2*a**3*b**4 + 4*a**2*b**5*x + 2*a*b**6*x**2) + 2*a**3*b*d*f*g*\log(a/b + x)/(2*a**3*b**4 + 4*a**2*b**5*x + 2*a*b**6*x**2) + a**3*b*d*f*g/(2*a**3*b**4 + 4*a**2*b**5*x + 2*a*b**6*x**2) - 12*a**3*b*d*f*h*x*\log(a/b + x)/(2*a**3*b**4 + 4*a**2*b**5*x + 2*a*b**6*x**2) + 4*a**2*b**2*c*f*h*x*\log(a/b + x)/(2*a**3*b**4 + 4*a**2*b**5*x + 2*a*b**6*x**2) + 4*a**2*b**2*d*e*h*x*\log(a/b + x)/(2*a**3*b**4 + 4*a**2*b**5*x + 2*a*b**6*x**2) + 4*a**2*b**2*d*f*g*x*\log(a/b + x)/(2*a**3*b**4 + 4*a**2*b**5*x + 2*a*b**6*x**2) - 6*a**2*b**2*d*f*h*x**2*\log(a/b + x)/(2*a**3*b**4 + 4*a**2*b**5*x + 2*a*b**6*x**2) + 6*a**2*b**2*d*f*h*x**2/(2*a**3*b**4 + 4*a**2*b**5*x + 2*a*b**6*x**2) - a*b**3*c*e*g/(2*a**3*b**4 + 4*a**2*b**5*x + 2*a*b**6*x**2) + 2*a*b**3*c*f*h*x**2*\log(a/b + x)/(2*a**3*b**4 + 4*a**2*b**5*x + 2*a*b**6*x**2) - 2*a*b**3*c*f*h*x**2/(2*a**3*b**4 + 4*a**2*b**5*x + 2*a*b**6*x**2) + 2*a*b**3*d*e*h*x**2*\log(a/b + x)/(2*a**3*b**4 + 4*a**2*b**5*x + 2*a*b**6*x**2) - 2*a*b**3*d*e*h*x**2/(2*a**3*b**4 + 4*a**2*b**5*x + 2*a*b**6*x**2) + 2*a*b**3*d*f*g*x**2*\log(a/b + x)/(2*a**3*b**4 + 4*a**2*b**5*x + 2*a*b**6*x**2) - 2*a*b**3*d*f*g*x**2/(2*a**3*b**4 + 4*a**2*b**5*x + 2*a*b**6*x**2) + 2*a*b**3*d*f*h*x**3/(2*a**3*b**4 + 4*a**2*b**5*x + 2*a*b**6*x**2) + b**4*c*e*h*x**2/(2*a**3*b**4 + 4*a**2*b**5*x + 2*a*b**6*x**2) + b**4*c*f*g*x**2/(2*a**3*b**4 + 4*a**2*b**5*x + 2*a*b**6*x**2) + b**4*d*e*g*x**2/(2*a**3*b**4 + 4*a**2*b**5*x + 2*a*b**6*x**2), Eq(m, -3)), (6*a**3*d*f*h*\log(a/b + x)/(2*a*b**4 + 2*b**5*x) + 6*a**3*d*f*h/(2*a*b**4 + 2*b**5*x) - 4*a**2*b*c*f*h*\log(a/b + x)/(2*a*b**4 + 2*b**5*x) - 4*a**2*b*c*f*h/(2*a*b**4 + 2*b**5*x) - 4*a**2*b*d*e*h*\log(a/b + x)/(2*a*b**4 + 2*b**5*x) - 4*a**2*b*d*e*h/(2*a*b**4 + 2*b**5*x) - 4*a**2*b*d*f*g*\log(a/b + x)/(2*a*b**4 + 2*b**5*x) - 4*a**2*b*d*f*g/(2*a*b**4 + 2*b**5*x) + 6*a**2*b*d*f*h*x*\log(a/b + x)/(2*a*b**4 + 2*b**5*x) + 2*a*b**2*c*e*h*\log(a/b + x)/(2*a*b**4 + 2*b**5*x) + 2*a*b**2*c*e*h/(2*a*b**4 + 2*b**5*x) + 2*a*b**2*c*f*g*\log(a/b + x)/(2*a*b**4 + 2*b**5*x) + 2*a*b**2*c*f*g/(2*a*b**4 + 2*b**5*x) - 4*a*b**2*c*f*h*x*\log(a/b + x)/(2*a*b**4 + 2*b**5*x) + 2*a*b**2*d*e*g*\log(a/b + x)/(2*a*b**4 + 2*b**5*x) + 2*a*b**2*d*e*g/(2*a*b**4 + 2*b**5*x) - 4*a*b**2*d*e*h*x*\log(a/b + x)/(2*a*b**4 + 2*b**5*x) - 4*a*b**2*d*f*g*x*\log(a/b + x)/(2*a*b**4 + 2*b**5*x) - 3*a*b**2*d*f*h*x**2/(2*a*b**4 + 2*b**5*x) - 2*b**3*c*e*g/(2*a*b**4 + 2*b**5*x) + 2*b**3*c*e*h*x*\log(a/b + x)/(2*a*b**4 + 2*b**5*x) + 2*b**3*c*f*g*x*\log(a/b + x)/(2*a*b**4 + 2*b**5*x) + 2*b**3*c*f*h*x**2/(2*a*b**4 + 2*b**5*x) + 2*b**3*d*e*g*x*\log(a/b + x)/(2*a*b**4 + 2*b**5*x) + 2*b**3*d*e*h*x**2/(2*a*b**4 + 2*b**5*x) + b**3*d*f*g*x**2/(2*a*b**4 + 2*b**5*x) + b**3*d*f*h*x**3/(2*a*b**4 + 2*b**5*x), Eq(m, -2)), (-a**3*d*f*h*\log(a/b + x)/b**4 + a**2*c*f*h*\log(a/b + x)/b**3 + a**2*d*e*h*\log(a/b + x)/b**3 + a**2*d*f*g*\log(a/b + x)/b**3 + a**2*d*f*h*x/b**3 - a*c*e*h*\log(a/b + x)/b**2 - a*c*f*g*\log(a/b + x)/b**2 - a*c*f*h*x/b**2 - a*d*e*g*\log(a/b + x)/b**2 - a*d*e*h*x/b**2 - a*d*f*g*x/b**2 - a*d*f*h*x**2/(2*b**2) + c*e*g*\log(a/b + x)/b + c*e*h*x/b + c*f*g*x/b + c*f*h
\end{aligned}$$

$$\begin{aligned}
& *2*x*(a + b*x)**m/(b**4*m**4 + 10*b**4*m**3 + 35*b**4*m**2 + 50*b**4*m + 24 \\
& *b**4) + 12*a*b**3*c*f*g*m*x*(a + b*x)**m/(b**4*m**4 + 10*b**4*m**3 + 35*b \\
& **4*m**2 + 50*b**4*m + 24*b**4) + a*b**3*c*f*h*m**3*x**2*(a + b*x)**m/(b**4* \\
& m**4 + 10*b**4*m**3 + 35*b**4*m**2 + 50*b**4*m + 24*b**4) + 5*a*b**3*c*f*h* \\
& m**2*x**2*(a + b*x)**m/(b**4*m**4 + 10*b**4*m**3 + 35*b**4*m**2 + 50*b**4*m \\
& + 24*b**4) + 4*a*b**3*c*f*h*m*x**2*(a + b*x)**m/(b**4*m**4 + 10*b**4*m**3 \\
& + 35*b**4*m**2 + 50*b**4*m + 24*b**4) + a*b**3*d*e*g*m**3*x*(a + b*x)**m/(b \\
& **4*m**4 + 10*b**4*m**3 + 35*b**4*m**2 + 50*b**4*m + 24*b**4) + 7*a*b**3*d* \\
& e*g*m**2*x*(a + b*x)**m/(b**4*m**4 + 10*b**4*m**3 + 35*b**4*m**2 + 50*b**4* \\
& m + 24*b**4) + 12*a*b**3*d*e*g*m*x*(a + b*x)**m/(b**4*m**4 + 10*b**4*m**3 + \\
& 35*b**4*m**2 + 50*b**4*m + 24*b**4) + a*b**3*d*e*h*m**3*x**2*(a + b*x)**m/ \\
& (b**4*m**4 + 10*b**4*m**3 + 35*b**4*m**2 + 50*b**4*m + 24*b**4) + 5*a*b**3* \\
& d*e*h*m**2*x**2*(a + b*x)**m/(b**4*m**4 + 10*b**4*m**3 + 35*b**4*m**2 + 50* \\
& b**4*m + 24*b**4) + 4*a*b**3*d*e*h*m*x**2*(a + b*x)**m/(b**4*m**4 + 10*b**4 \\
& *m**3 + 35*b**4*m**2 + 50*b**4*m + 24*b**4) + a*b**3*d*f*g*m**3*x**2*(a + b \\
& *x)**m/(b**4*m**4 + 10*b**4*m**3 + 35*b**4*m**2 + 50*b**4*m + 24*b**4) + 5* \\
& a*b**3*d*f*g*m**2*x**2*(a + b*x)**m/(b**4*m**4 + 10*b**4*m**3 + 35*b**4*m** \\
& 2 + 50*b**4*m + 24*b**4) + 4*a*b**3*d*f*g*m*x**2*(a + b*x)**m/(b**4*m**4 + \\
& 10*b**4*m**3 + 35*b**4*m**2 + 50*b**4*m + 24*b**4) + a*b**3*d*f*h*m**3*x**3 \\
& *(a + b*x)**m/(b**4*m**4 + 10*b**4*m**3 + 35*b**4*m**2 + 50*b**4*m + 24*b** \\
& 4) + 3*a*b**3*d*f*h*m**2*x**3*(a + b*x)**m/(b**4*m**4 + 10*b**4*m**3 + 35*b \\
& **4*m**2 + 50*b**4*m + 24*b**4) + 2*a*b**3*d*f*h*m*x**3*(a + b*x)**m/(b**4* \\
& m**4 + 10*b**4*m**3 + 35*b**4*m**2 + 50*b**4*m + 24*b**4) + b**4*c*e*g*m**3 \\
& *x*(a + b*x)**m/(b**4*m**4 + 10*b**4*m**3 + 35*b**4*m**2 + 50*b**4*m + 24*b \\
& **4) + 9*b**4*c*e*g*m**2*x*(a + b*x)**m/(b**4*m**4 + 10*b**4*m**3 + 35*b**4 \\
& *m**2 + 50*b**4*m + 24*b**4) + 26*b**4*c*e*g*m*x*(a + b*x)**m/(b**4*m**4 + \\
& 10*b**4*m**3 + 35*b**4*m**2 + 50*b**4*m + 24*b**4) + 24*b**4*c*e*g*x*(a + b \\
& *x)**m/(b**4*m**4 + 10*b**4*m**3 + 35*b**4*m**2 + 50*b**4*m + 24*b**4) + b* \\
& **4*c*e*h*m**3*x**2*(a + b*x)**m/(b**4*m**4 + 10*b**4*m**3 + 35*b**4*m**2 + \\
& 50*b**4*m + 24*b**4) + 8*b**4*c*e*h*m**2*x**2*(a + b*x)**m/(b**4*m**4 + 10* \\
& b**4*m**3 + 35*b**4*m**2 + 50*b**4*m + 24*b**4) + 19*b**4*c*e*h*m*x**2*(a + \\
& b*x)**m/(b**4*m**4 + 10*b**4*m**3 + 35*b**4*m**2 + 50*b**4*m + 24*b**4) + \\
& 12*b**4*c*e*h*x**2*(a + b*x)**m/(b**4*m**4 + 10*b**4*m**3 + 35*b**4*m**2 + \\
& 50*b**4*m + 24*b**4) + b**4*c*f*g*m**3*x**2*(a + b*x)**m/(b**4*m**4 + 10*b \\
& **4*m**3 + 35*b**4*m**2 + 50*b**4*m + 24*b**4) + 8*b**4*c*f*g*m**2*x**2*(a + \\
& b*x)**m/(b**4*m**4 + 10*b**4*m**3 + 35*b**4*m**2 + 50*b**4*m + 24*b**4) + \\
& 19*b**4*c*f*g*m*x**2*(a + b*x)**m/(b**4*m**4 + 10*b**4*m**3 + 35*b**4*m**2 \\
& + 50*b**4*m + 24*b**4) + 12*b**4*c*f*g*x**2*(a + b*x)**m/(b**4*m**4 + 10*b \\
& **4*m**3 + 35*b**4*m**2 + 50*b**4*m + 24*b**4) + b**4*c*f*h*m**3*x**3*(a + b \\
& *x)**m/(b**4*m**4 + 10*b**4*m**3 + 35*b**4*m**2 + 50*b**4*m + 24*b**4) + 7* \\
& b**4*c*f*h*m**2*x**3*(a + b*x)**m/(b**4*m**4 + 10*b**4*m**3 + 35*b**4*m**2 \\
& + 50*b**4*m + 24*b**4) + 14*b**4*c*f*h*m*x**3*(a + b*x)**m/(b**4*m**4 + 10* \\
& b**4*m**3 + 35*b**4*m**2 + 50*b**4*m + 24*b**4) + 8*b**4*c*f*h*x**3*(a + b* \\
& x)**m/(b**4*m**4 + 10*b**4*m**3 + 35*b**4*m**2 + 50*b**4*m + 24*b**4) + b** \\
& 4*d*e*g*m**3*x**2*(a + b*x)**m/(b**4*m**4 + 10*b**4*m**3 + 35*b**4*m**2 + 5
\end{aligned}$$

```

0*b**4*m + 24*b**4) + 8*b**4*d*e*g*m**2*x**2*(a + b*x)**m/(b**4*m**4 + 10*b
**4*m**3 + 35*b**4*m**2 + 50*b**4*m + 24*b**4) + 19*b**4*d*e*g*m*x**2*(a +
b*x)**m/(b**4*m**4 + 10*b**4*m**3 + 35*b**4*m**2 + 50*b**4*m + 24*b**4) + 1
2*b**4*d*e*g*x**2*(a + b*x)**m/(b**4*m**4 + 10*b**4*m**3 + 35*b**4*m**2 + 5
0*b**4*m + 24*b**4) + b**4*d*e*h*m**3*x**3*(a + b*x)**m/(b**4*m**4 + 10*b**
4*m**3 + 35*b**4*m**2 + 50*b**4*m + 24*b**4) + 7*b**4*d*e*h*m**2*x**3*(a +
b*x)**m/(b**4*m**4 + 10*b**4*m**3 + 35*b**4*m**2 + 50*b**4*m + 24*b**4) + 1
4*b**4*d*e*h*m*x**3*(a + b*x)**m/(b**4*m**4 + 10*b**4*m**3 + 35*b**4*m**2 +
50*b**4*m + 24*b**4) + 8*b**4*d*e*h*x**3*(a + b*x)**m/(b**4*m**4 + 10*b**4
*m**3 + 35*b**4*m**2 + 50*b**4*m + 24*b**4) + b**4*d*f*g*m**3*x**3*(a + b*x
)**m/(b**4*m**4 + 10*b**4*m**3 + 35*b**4*m**2 + 50*b**4*m + 24*b**4) + 7*b*
**4*d*f*g*m**2*x**3*(a + b*x)**m/(b**4*m**4 + 10*b**4*m**3 + 35*b**4*m**2 +
50*b**4*m + 24*b**4) + 14*b**4*d*f*g*m*x**3*(a + b*x)**m/(b**4*m**4 + 10*b*
**4*m**3 + 35*b**4*m**2 + 50*b**4*m + 24*b**4) + 8*b**4*d*f*g*x**3*(a + b*x)
**m/(b**4*m**4 + 10*b**4*m**3 + 35*b**4*m**2 + 50*b**4*m + 24*b**4) + b**4*
d*f*h*m**3*x**4*(a + b*x)**m/(b**4*m**4 + 10*b**4*m**3 + 35*b**4*m**2 + 50*
b**4*m + 24*b**4) + 6*b**4*d*f*h*m**2*x**4*(a + b*x)**m/(b**4*m**4 + 10*b**
4*m**3 + 35*b**4*m**2 + 50*b**4*m + 24*b**4) + 11*b**4*d*f*h*m*x**4*(a + b*
x)**m/(b**4*m**4 + 10*b**4*m**3 + 35*b**4*m**2 + 50*b**4*m + 24*b**4) + 6*b
**4*d*f*h*x**4*(a + b*x)**m/(b**4*m**4 + 10*b**4*m**3 + 35*b**4*m**2 + 50*b
**4*m + 24*b**4), True))

```

Giac [B] time = 2.65803, size = 2248, normalized size = 13.46

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b*x+a)^m*(d*x+c)*(f*x+e)*(h*x+g),x, algorithm="giac")

[Out] ((b*x + a)^m*b^4*d*f*h*m^3*x^4 + (b*x + a)^m*b^4*d*f*g*m^3*x^3 + (b*x + a)^m*b^4*c*f*h*m^3*x^3 + (b*x + a)^m*a*b^3*d*f*h*m^3*x^3 + 6*(b*x + a)^m*b^4*d*f*h*m^2*x^4 + (b*x + a)^m*b^4*d*h*m^3*x^3*e + (b*x + a)^m*b^4*c*f*g*m^3*x^2 + (b*x + a)^m*a*b^3*d*f*g*m^3*x^2 + (b*x + a)^m*a*b^3*c*f*h*m^3*x^2 + 7*(b*x + a)^m*b^4*d*f*g*m^2*x^3 + 7*(b*x + a)^m*b^4*c*f*h*m^2*x^3 + 3*(b*x + a)^m*a*b^3*d*f*h*m^2*x^3 + 11*(b*x + a)^m*b^4*d*f*h*m*x^4 + (b*x + a)^m*b^4*d*g*m^3*x^2*e + (b*x + a)^m*b^4*c*h*m^3*x^2*e + (b*x + a)^m*a*b^3*d*h*m^3*x^2*e + 7*(b*x + a)^m*b^4*d*h*m^2*x^3*e + (b*x + a)^m*a*b^3*c*f*g*m^3*x + 8*(b*x + a)^m*b^4*c*f*g*m^2*x^2 + 5*(b*x + a)^m*a*b^3*d*f*g*m^2*x^2 + 5*(b*x + a)^m*a*b^3*c*f*h*m^2*x^2 - 3*(b*x + a)^m*a^2*b^2*d*f*h*m^2*x^2 + 14*(b*x + a)^m*b^4*d*f*g*m*x^3 + 14*(b*x + a)^m*b^4*c*f*h*m*x^3 + 2*(b*x + a)^m*a*b^3*d*f*h*m*x^3 + 6*(b*x + a)^m*b^4*d*f*h*x^4 + (b*x + a)^m*b^4*c*g*m^3*x*e

$$\begin{aligned}
& + (b*x + a)^m*a*b^3*d*g*m^3*x*x*e + (b*x + a)^m*a*b^3*c*h*m^3*x*x*e + 8*(b*x + a)^m*b^4*d*g*m^2*x^2*e + 8*(b*x + a)^m*b^4*c*h*m^2*x^2*e + 5*(b*x + a)^m*a*b^3*d*h*m^2*x^2*e + 14*(b*x + a)^m*b^4*d*h*m*x^3*e + 7*(b*x + a)^m*a*b^3*c*f*g*m^2*x - 2*(b*x + a)^m*a^2*b^2*d*f*g*m^2*x - 2*(b*x + a)^m*a^2*b^2*c*f*h*m^2*x + 19*(b*x + a)^m*b^4*c*f*g*m*x^2 + 4*(b*x + a)^m*a*b^3*d*f*g*m*x^2 + 4*(b*x + a)^m*a*b^3*c*f*h*m*x^2 - 3*(b*x + a)^m*a^2*b^2*d*f*h*m*x^2 + 8*(b*x + a)^m*b^4*d*f*g*x^3 + 8*(b*x + a)^m*b^4*c*f*h*x^3 + (b*x + a)^m*a*b^3*c*g*m^3*e + 9*(b*x + a)^m*b^4*c*g*m^2*x*x*e + 7*(b*x + a)^m*a*b^3*d*g*m^2*x*x*e + 7*(b*x + a)^m*a*b^3*c*h*m^2*x*x*e - 2*(b*x + a)^m*a^2*b^2*d*h*m^2*x*x*e + 19*(b*x + a)^m*b^4*d*g*m*x^2*e + 19*(b*x + a)^m*b^4*c*h*m*x^2*e + 4*(b*x + a)^m*a*b^3*d*h*m*x^2*e + 8*(b*x + a)^m*b^4*d*h*x^3*e - (b*x + a)^m*a^2*b^2*c*f*g*m^2 + 12*(b*x + a)^m*a*b^3*c*f*g*m*x - 8*(b*x + a)^m*a^2*b^2*d*f*g*m*x - 8*(b*x + a)^m*a^2*b^2*c*f*h*m*x + 6*(b*x + a)^m*a^3*b*d*f*h*m*x + 12*(b*x + a)^m*b^4*c*f*g*x^2 + 9*(b*x + a)^m*a*b^3*c*g*m^2*e - (b*x + a)^m*a^2*b^2*d*g*m^2*e - (b*x + a)^m*a^2*b^2*c*h*m^2*e + 26*(b*x + a)^m*b^4*c*g*m*x*x*e + 12*(b*x + a)^m*a*b^3*d*g*m*x*x*e + 12*(b*x + a)^m*a*b^3*c*h*m*x*x*e - 8*(b*x + a)^m*a^2*b^2*d*h*m*x*x*e + 12*(b*x + a)^m*b^4*d*g*x^2*e + 12*(b*x + a)^m*b^4*c*h*x^2*e - 7*(b*x + a)^m*a^2*b^2*c*f*g*m + 2*(b*x + a)^m*a^3*b*d*f*g*m + 2*(b*x + a)^m*a^3*b*c*f*h*m + 26*(b*x + a)^m*a*b^3*c*g*m*x*e - 7*(b*x + a)^m*a^2*b^2*d*g*m*x*e - 7*(b*x + a)^m*a^2*b^2*c*h*m*x*e + 2*(b*x + a)^m*a^3*b*d*h*m*x*e + 24*(b*x + a)^m*b^4*c*g*x*x*e - 12*(b*x + a)^m*a^2*b^2*c*f*g + 8*(b*x + a)^m*a^3*b*d*f*g + 8*(b*x + a)^m*a^3*b*c*f*h - 6*(b*x + a)^m*a^4*d*f*h + 24*(b*x + a)^m*a*b^3*c*g*x*e - 12*(b*x + a)^m*a^2*b^2*d*g*x*e - 12*(b*x + a)^m*a^2*b^2*c*h*x*e + 8*(b*x + a)^m*a^3*b*d*h*x*e)/(b^4*m^4 + 10*b^4*m^3 + 35*b^4*m^2 + 50*b^4*m + 24*b^4)
\end{aligned}$$

$$3.120 \quad \int \frac{(a+bx)^m(c+dx)(e+fx)}{g+hx} dx$$

Optimal. Leaf size=134

$$\frac{(a+bx)^{m+1}(dg-ch)(fg-eh) {}_2F_1\left(1, m+1; m+2; -\frac{h(a+bx)}{bg-ah}\right)}{h^2(m+1)(bg-ah)} - \frac{(a+bx)^{m+1}(adfh + b(m+2)(-cfh - deh + dfg) - bdfh)}{b^2h^2(m+1)(m+2)}$$

[Out] -(((a + b*x)^(1 + m)*(a*d*f*h + b*(d*f*g - d*e*h - c*f*h)*(2 + m) - b*d*f*h*(1 + m)*x))/(b^2*h^2*(1 + m)*(2 + m))) + ((d*g - c*h)*(f*g - e*h)*(a + b*x)^(1 + m)*Hypergeometric2F1[1, 1 + m, 2 + m, -(h*(a + b*x))/(b*g - a*h)])/(h^2*(b*g - a*h)*(1 + m))

Rubi [A] time = 0.0860064, antiderivative size = 134, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.08$, Rules used = {147, 68}

$$\frac{(a+bx)^{m+1}(dg-ch)(fg-eh) {}_2F_1\left(1, m+1; m+2; -\frac{h(a+bx)}{bg-ah}\right)}{h^2(m+1)(bg-ah)} - \frac{(a+bx)^{m+1}(adfh + b(m+2)(-cfh - deh + dfg) - bdfh)}{b^2h^2(m+1)(m+2)}$$

Antiderivative was successfully verified.

[In] Int[((a + b*x)^m*(c + d*x)*(e + f*x))/(g + h*x), x]

[Out] -(((a + b*x)^(1 + m)*(a*d*f*h + b*(d*f*g - d*e*h - c*f*h)*(2 + m) - b*d*f*h*(1 + m)*x))/(b^2*h^2*(1 + m)*(2 + m))) + ((d*g - c*h)*(f*g - e*h)*(a + b*x)^(1 + m)*Hypergeometric2F1[1, 1 + m, 2 + m, -(h*(a + b*x))/(b*g - a*h)])/(h^2*(b*g - a*h)*(1 + m))

Rule 147

Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))*((g_.) + (h_.)*(x_)), x_Symbol] := -Simp[((a*d*f*h*(n + 2) + b*c*f*h*(m + 2) - b*d*(f*g + e*h)*(m + n + 3) - b*d*f*h*(m + n + 2)*x)*(a + b*x)^(m + 1)*(c + d*x)^(n + 1))/(b^2*d^2*(m + n + 2)*(m + n + 3)), x] + Dist[(a^2*d^2*f*h*(n + 1)*(n + 2) + a*b*d*(n + 1)*(2*c*f*h*(m + 1) - d*(f*g + e*h)*(m + n + 3)) + b^2*(c^2*f*h*(m + 1)*(m + 2) - c*d*(f*g + e*h)*(m + 1)*(m + n + 3) + d^2*e*g*(m + n + 2)*(m + n + 3)))/(b^2*d^2*(m + n + 2)*(m + n + 3)), Int[(a + b*x)^m*(c + d*x)^n, x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n}, x] && NeQ[m + n + 2, 0] && NeQ[m + n + 3, 0]

Rule 68

```
Int[((a_) + (b_)*(x_))^(m_)*((c_) + (d_)*(x_))^(n_), x_Symbol] := Simp[(((
b*c - a*d)^n*(a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a
+ b*x))/(b*c - a*d))])/(b^(n + 1)*(m + 1)), x] /; FreeQ[{a, b, c, d, m}, x]
&& NeQ[b*c - a*d, 0] && !IntegerQ[m] && IntegerQ[n]
```

Rubi steps

$$\int \frac{(a + bx)^m (c + dx)(e + fx)}{g + hx} dx = -\frac{(a + bx)^{1+m} (adfh + b(dfg - deh - cfh)(2 + m) - bdfh(1 + m)x)}{b^2 h^2 (1 + m)(2 + m)} + \frac{((dg - ch)(fg - eh) + (d^2 c - a^2 f)) (a + bx)^{1+m}}{b^2 h^2 (1 + m)(2 + m)}$$

$$= -\frac{(a + bx)^{1+m} (adfh + b(dfg - deh - cfh)(2 + m) - bdfh(1 + m)x)}{b^2 h^2 (1 + m)(2 + m)} + \frac{(dg - ch)(fg - eh) + (d^2 c - a^2 f)}{b^2 h^2}$$

Mathematica [A] time = 0.190052, size = 120, normalized size = 0.9

$$\frac{(a + bx)^{m+1} \left(\frac{b(cf h + deh - dfg) - adfh}{b^2(m+1)} + \frac{dfh(a+bx)}{b^2(m+2)} + \frac{(dg-ch)(fg-eh) {}_2F_1\left(1, m+1; m+2; \frac{h(a+bx)}{ah-bg}\right)}{(m+1)(bg-ah)} \right)}{h^2}$$

Antiderivative was successfully verified.

[In] Integrate[((a + b*x)^m*(c + d*x)*(e + f*x))/(g + h*x), x]

[Out] ((a + b*x)^(1 + m)*((-a*d*f*h) + b*(-(d*f*g) + d*e*h + c*f*h))/(b^2*(1 + m)) + (d*f*h*(a + b*x))/(b^2*(2 + m)) + (((d*g - c*h)*(f*g - e*h)*Hypergeometric2F1[1, 1 + m, 2 + m, (h*(a + b*x))/(-(b*g) + a*h)])/((b*g - a*h)*(1 + m)))/h^2

Maple [F] time = 0.053, size = 0, normalized size = 0.

$$\int \frac{(fx + e)(dx + c)(bx + a)^m}{hx + g} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b*x+a)^m*(d*x+c)*(f*x+e)/(h*x+g), x)

[Out] `int((b*x+a)^m*(d*x+c)*(f*x+e)/(h*x+g),x)`

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dx + c)(fx + e)(bx + a)^m}{hx + g} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((b*x+a)^m*(d*x+c)*(f*x+e)/(h*x+g),x, algorithm="maxima")`

[Out] `integrate((d*x + c)*(f*x + e)*(b*x + a)^m/(h*x + g), x)`

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{(dfx^2 + ce + (de + cf)x)(bx + a)^m}{hx + g}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((b*x+a)^m*(d*x+c)*(f*x+e)/(h*x+g),x, algorithm="fricas")`

[Out] `integral((d*f*x^2 + c*e + (d*e + c*f)*x)*(b*x + a)^m/(h*x + g), x)`

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(a + bx)^m (c + dx)(e + fx)}{g + hx} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((b*x+a)**m*(d*x+c)*(f*x+e)/(h*x+g),x)`

[Out] `Integral((a + b*x)**m*(c + d*x)*(e + f*x)/(g + h*x), x)`

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dx + c)(fx + e)(bx + a)^m}{hx + g} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b*x+a)^m*(d*x+c)*(f*x+e)/(h*x+g),x, algorithm="giac")

[Out] integrate((d*x + c)*(f*x + e)*(b*x + a)^m/(h*x + g), x)

$$3.121 \quad \int \frac{(a+bx)^m(c+dx)}{(e+fx)(g+hx)} dx$$

Optimal. Leaf size=140

$$\frac{(a+bx)^{m+1}(dg-ch)_2F_1\left(1, m+1; m+2; -\frac{h(a+bx)}{bg-ah}\right)}{(m+1)(bg-ah)(fg-eh)} - \frac{(a+bx)^{m+1}(de-cf)_2F_1\left(1, m+1; m+2; -\frac{f(a+bx)}{be-af}\right)}{(m+1)(be-af)(fg-eh)}$$

[Out] -(((d*e - c*f)*(a + b*x)^(1 + m)*Hypergeometric2F1[1, 1 + m, 2 + m, -((f*(a + b*x))/(b*e - a*f))])/((b*e - a*f)*(f*g - e*h)*(1 + m))) + ((d*g - c*h)*(a + b*x)^(1 + m)*Hypergeometric2F1[1, 1 + m, 2 + m, -((h*(a + b*x))/(b*g - a*h))])/((b*g - a*h)*(f*g - e*h)*(1 + m))

Rubi [A] time = 0.0591633, antiderivative size = 140, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.074$, Rules used = {156, 68}

$$\frac{(a+bx)^{m+1}(dg-ch)_2F_1\left(1, m+1; m+2; -\frac{h(a+bx)}{bg-ah}\right)}{(m+1)(bg-ah)(fg-eh)} - \frac{(a+bx)^{m+1}(de-cf)_2F_1\left(1, m+1; m+2; -\frac{f(a+bx)}{be-af}\right)}{(m+1)(be-af)(fg-eh)}$$

Antiderivative was successfully verified.

[In] Int[((a + b*x)^m*(c + d*x))/((e + f*x)*(g + h*x)), x]

[Out] -(((d*e - c*f)*(a + b*x)^(1 + m)*Hypergeometric2F1[1, 1 + m, 2 + m, -((f*(a + b*x))/(b*e - a*f))])/((b*e - a*f)*(f*g - e*h)*(1 + m))) + ((d*g - c*h)*(a + b*x)^(1 + m)*Hypergeometric2F1[1, 1 + m, 2 + m, -((h*(a + b*x))/(b*g - a*h))])/((b*g - a*h)*(f*g - e*h)*(1 + m))

Rule 156

Int[(((e_.) + (f_.)*(x_))^(p_)*((g_.) + (h_.)*(x_)))/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] := Dist[(b*g - a*h)/(b*c - a*d), Int[(e + f*x)^p/(a + b*x), x], x] - Dist[(d*g - c*h)/(b*c - a*d), Int[(e + f*x)^p/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x]

Rule 68

Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] := Simp[((b*c - a*d)^n*(a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a + b*x))/(b*c - a*d))]/(b^(n + 1)*(m + 1)), x] /; FreeQ[{a, b, c, d, m}, x]

&& NeQ[b*c - a*d, 0] && !IntegerQ[m] && IntegerQ[n]

Rubi steps

$$\int \frac{(a+bx)^m(c+dx)}{(e+fx)(g+hx)} dx = -\frac{(de-cf) \int \frac{(a+bx)^m}{e+fx} dx}{fg-eh} + \frac{(dg-ch) \int \frac{(a+bx)^m}{g+hx} dx}{fg-eh}$$

$$= -\frac{(de-cf)(a+bx)^{1+m} {}_2F_1\left(1, 1+m; 2+m; -\frac{f(a+bx)}{be-af}\right)}{(be-af)(fg-eh)(1+m)} + \frac{(dg-ch)(a+bx)^{1+m} {}_2F_1\left(1, 1+m; 2+m; -\frac{h(a+bx)}{ah-bg}\right)}{(ah-bg)(fg-eh)(1+m)}$$

Mathematica [A] time = 0.0939513, size = 115, normalized size = 0.82

$$\frac{(a+bx)^{m+1} \left(\frac{(dg-ch) {}_2F_1\left(1, m+1; m+2; \frac{h(a+bx)}{ah-bg}\right)}{bg-ah} - \frac{(de-cf) {}_2F_1\left(1, m+1; m+2; \frac{f(a+bx)}{af-be}\right)}{be-af} \right)}{(m+1)(fg-eh)}$$

Antiderivative was successfully verified.

[In] Integrate[((a + b*x)^m*(c + d*x))/((e + f*x)*(g + h*x)), x]

[Out] ((a + b*x)^(1 + m)*(-(((d*e - c*f)*Hypergeometric2F1[1, 1 + m, 2 + m, (f*(a + b*x))/(-(b*e) + a*f)])/(b*e - a*f)) + ((d*g - c*h)*Hypergeometric2F1[1, 1 + m, 2 + m, (h*(a + b*x))/(-(b*g) + a*h)]/(b*g - a*h)))/((f*g - e*h)*(1 + m))

Maple [F] time = 0.066, size = 0, normalized size = 0.

$$\int \frac{(dx+c)(bx+a)^m}{(fx+e)(hx+g)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b*x+a)^m*(d*x+c)/(f*x+e)/(h*x+g), x)

[Out] int((b*x+a)^m*(d*x+c)/(f*x+e)/(h*x+g), x)

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dx + c)(bx + a)^m}{(fx + e)(hx + g)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b*x+a)^m*(d*x+c)/(f*x+e)/(h*x+g),x, algorithm="maxima")

[Out] integrate((d*x + c)*(b*x + a)^m/((f*x + e)*(h*x + g)), x)

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{(dx + c)(bx + a)^m}{f hx^2 + eg + (fg + eh)x}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b*x+a)^m*(d*x+c)/(f*x+e)/(h*x+g),x, algorithm="fricas")

[Out] integral((d*x + c)*(b*x + a)^m/(f*h*x^2 + e*g + (f*g + e*h)*x), x)

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(a + bx)^m (c + dx)}{(e + fx)(g + hx)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b*x+a)**m*(d*x+c)/(f*x+e)/(h*x+g),x)

[Out] Integral((a + b*x)**m*(c + d*x)/((e + f*x)*(g + h*x)), x)

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dx + c)(bx + a)^m}{(fx + e)(hx + g)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^m*(d*x+c)/(f*x+e)/(h*x+g),x, algorithm="giac")
```

```
[Out] integrate((d*x + c)*(b*x + a)^m/((f*x + e)*(h*x + g)), x)
```

$$3.122 \quad \int \frac{(a+bx)^m}{(c+dx)(e+fx)(g+hx)} dx$$

Optimal. Leaf size=224

$$\frac{d^2(a+bx)^{m+1} {}_2F_1\left(1, m+1; m+2; -\frac{d(a+bx)}{bc-ad}\right)}{(m+1)(bc-ad)(de-cf)(dg-ch)} - \frac{f^2(a+bx)^{m+1} {}_2F_1\left(1, m+1; m+2; -\frac{f(a+bx)}{be-af}\right)}{(m+1)(be-af)(de-cf)(fg-eh)} + \frac{h^2(a+bx)^{m+1} {}_2F_1\left(1, m+1; m+2; -\frac{h(a+bx)}{bg-ah}\right)}{(m+1)(bg-ah)(dg-ch)}$$

[Out] (d^2*(a + b*x)^(1 + m)*Hypergeometric2F1[1, 1 + m, 2 + m, -((d*(a + b*x))/(b*c - a*d))]/((b*c - a*d)*(d*e - c*f)*(d*g - c*h)*(1 + m)) - (f^2*(a + b*x)^(1 + m)*Hypergeometric2F1[1, 1 + m, 2 + m, -((f*(a + b*x))/(b*e - a*f))]/((b*e - a*f)*(d*e - c*f)*(f*g - e*h)*(1 + m)) + (h^2*(a + b*x)^(1 + m)*Hypergeometric2F1[1, 1 + m, 2 + m, -((h*(a + b*x))/(b*g - a*h))]/((b*g - a*h)*(d*g - c*h)*(f*g - e*h)*(1 + m)))

Rubi [A] time = 0.194952, antiderivative size = 224, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 2, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.069$, Rules used = {180, 68}

$$\frac{d^2(a+bx)^{m+1} {}_2F_1\left(1, m+1; m+2; -\frac{d(a+bx)}{bc-ad}\right)}{(m+1)(bc-ad)(de-cf)(dg-ch)} - \frac{f^2(a+bx)^{m+1} {}_2F_1\left(1, m+1; m+2; -\frac{f(a+bx)}{be-af}\right)}{(m+1)(be-af)(de-cf)(fg-eh)} + \frac{h^2(a+bx)^{m+1} {}_2F_1\left(1, m+1; m+2; -\frac{h(a+bx)}{bg-ah}\right)}{(m+1)(bg-ah)(dg-ch)}$$

Antiderivative was successfully verified.

[In] Int[(a + b*x)^m/((c + d*x)*(e + f*x)*(g + h*x)), x]

[Out] (d^2*(a + b*x)^(1 + m)*Hypergeometric2F1[1, 1 + m, 2 + m, -((d*(a + b*x))/(b*c - a*d))]/((b*c - a*d)*(d*e - c*f)*(d*g - c*h)*(1 + m)) - (f^2*(a + b*x)^(1 + m)*Hypergeometric2F1[1, 1 + m, 2 + m, -((f*(a + b*x))/(b*e - a*f))]/((b*e - a*f)*(d*e - c*f)*(f*g - e*h)*(1 + m)) + (h^2*(a + b*x)^(1 + m)*Hypergeometric2F1[1, 1 + m, 2 + m, -((h*(a + b*x))/(b*g - a*h))]/((b*g - a*h)*(d*g - c*h)*(f*g - e*h)*(1 + m)))

Rule 180

Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_)*((e_.) + (f_.)*(x_))^(p_)*((g_.) + (h_.)*(x_))^(q_), x_Symbol] := Int[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n*(e + f*x)^p*(g + h*x)^q, x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n}, x] && IntegersQ[p, q]

Rule 68

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] := Simp[((
b*c - a*d)^n*(a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a
+ b*x))/(b*c - a*d))]/(b^(n + 1)*(m + 1)), x] /; FreeQ[{a, b, c, d, m}, x]
&& NeQ[b*c - a*d, 0] && !IntegerQ[m] && IntegerQ[n]
```

Rubi steps

$$\begin{aligned} \int \frac{(a + bx)^m}{(c + dx)(e + fx)(g + hx)} dx &= \int \left(\frac{d^2(a + bx)^m}{(de - cf)(dg - ch)(c + dx)} + \frac{f^2(a + bx)^m}{(de - cf)(-fg + eh)(e + fx)} + \frac{h^2(a + bx)^m}{(dg - ch)(fg - eh)(g + hx)} \right) dx \\ &= \frac{d^2 \int \frac{(a+bx)^m}{c+dx} dx}{(de - cf)(dg - ch)} - \frac{f^2 \int \frac{(a+bx)^m}{e+fx} dx}{(de - cf)(fg - eh)} + \frac{h^2 \int \frac{(a+bx)^m}{g+hx} dx}{(dg - ch)(fg - eh)} \\ &= \frac{d^2(a + bx)^{1+m} {}_2F_1\left(1, 1 + m; 2 + m; -\frac{d(a+bx)}{bc-ad}\right)}{(bc - ad)(de - cf)(dg - ch)(1 + m)} - \frac{f^2(a + bx)^{1+m} {}_2F_1\left(1, 1 + m; 2 + m; -\frac{f(a+bx)}{af-be}\right)}{(af - be)(de - cf)(fg - eh)(1 + m)} + \frac{h^2(a + bx)^{1+m} {}_2F_1\left(1, 1 + m; 2 + m; \frac{h(a+bx)}{ah-bg}\right)}{(ah - bg)(dg - ch)(fg - eh)(1 + m)} \end{aligned}$$

Mathematica [A] time = 0.395389, size = 193, normalized size = 0.86

$$\frac{(a + bx)^{m+1} \left(\frac{d^2 {}_2F_1\left(1, m+1; m+2; \frac{d(a+bx)}{ad-bc}\right)}{(bc-ad)(cf-de)(ch-dg)} + \frac{f^2 {}_2F_1\left(1, m+1; m+2; \frac{f(a+bx)}{af-be}\right)}{(be-af)(de-cf)(eh-fg)} + \frac{h^2 {}_2F_1\left(1, m+1; m+2; \frac{h(a+bx)}{ah-bg}\right)}{(bg-ah)(dg-ch)(fg-eh)} \right)}{m + 1}$$

Antiderivative was successfully verified.

[In] Integrate[(a + b*x)^m/((c + d*x)*(e + f*x)*(g + h*x)), x]

[Out] ((a + b*x)^(1 + m)*((d^2*Hypergeometric2F1[1, 1 + m, 2 + m, (d*(a + b*x))/(-b*c) + a*d)]/((b*c - a*d)*(-(d*e) + c*f)*(-(d*g) + c*h)) + (f^2*Hypergeometric2F1[1, 1 + m, 2 + m, (f*(a + b*x))/(-b*e) + a*f])/((b*e - a*f)*(d*e - c*f)*(-(f*g) + e*h)) + (h^2*Hypergeometric2F1[1, 1 + m, 2 + m, (h*(a + b*x))/(-b*g) + a*h])/((b*g - a*h)*(d*g - c*h)*(f*g - e*h)))/((1 + m))

Maple [F] time = 0.101, size = 0, normalized size = 0.

$$\int \frac{(bx + a)^m}{(hx + g)(fx + e)(dx + c)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `int((b*x+a)^m/(d*x+c)/(f*x+e)/(h*x+g),x)`

[Out] `int((b*x+a)^m/(d*x+c)/(f*x+e)/(h*x+g),x)`

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bx + a)^m}{(dx + c)(fx + e)(hx + g)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((b*x+a)^m/(d*x+c)/(f*x+e)/(h*x+g),x, algorithm="maxima")`

[Out] `integrate((b*x + a)^m/((d*x + c)*(f*x + e)*(h*x + g)), x)`

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{(bx + a)^m}{dfhx^3 + ceg + (dfg + (de + cf)h)x^2 + (ceh + (de + cf)g)x}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((b*x+a)^m/(d*x+c)/(f*x+e)/(h*x+g),x, algorithm="fricas")`

[Out] `integral((b*x + a)^m/(d*f*h*x^3 + c*e*g + (d*f*g + (d*e + c*f)*h)*x^2 + (c*e*h + (d*e + c*f)*g)*x), x)`

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((b*x+a)**m/(d*x+c)/(f*x+e)/(h*x+g),x)`

[Out] Timed out

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bx + a)^m}{(dx + c)(fx + e)(hx + g)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b*x+a)^m/(d*x+c)/(f*x+e)/(h*x+g),x, algorithm="giac")

[Out] integrate((b*x + a)^m/((d*x + c)*(f*x + e)*(h*x + g)), x)

$$3.123 \quad \int \frac{x^m(e+fx)^n}{(a+bx)(c+dx)} dx$$

Optimal. Leaf size=140

$$\frac{bx^{m+1}(e+fx)^n \left(\frac{fx}{e} + 1\right)^{-n} F_1\left(m+1; -n, 1; m+2; -\frac{fx}{e}, -\frac{bx}{a}\right)}{a(m+1)(bc-ad)} - \frac{dx^{m+1}(e+fx)^n \left(\frac{fx}{e} + 1\right)^{-n} F_1\left(m+1; -n, 1; m+2; -\frac{fx}{e}, -\frac{dx}{c}\right)}{c(m+1)(bc-ad)}$$

[Out] (b*x^(1+m)*(e+f*x)^n*AppellF1[1+m, -n, 1, 2+m, -((f*x)/e), -((b*x)/a)]/(a*(b*c - a*d)*(1+m)*(1+(f*x)/e)^n) - (d*x^(1+m)*(e+f*x)^n*AppellF1[1+m, -n, 1, 2+m, -((f*x)/e), -((d*x)/c)]/(c*(b*c - a*d)*(1+m)*(1+(f*x)/e)^n)

Rubi [A] time = 0.122773, antiderivative size = 140, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 3, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.12$, Rules used = {180, 135, 133}

$$\frac{bx^{m+1}(e+fx)^n \left(\frac{fx}{e} + 1\right)^{-n} F_1\left(m+1; -n, 1; m+2; -\frac{fx}{e}, -\frac{bx}{a}\right)}{a(m+1)(bc-ad)} - \frac{dx^{m+1}(e+fx)^n \left(\frac{fx}{e} + 1\right)^{-n} F_1\left(m+1; -n, 1; m+2; -\frac{fx}{e}, -\frac{dx}{c}\right)}{c(m+1)(bc-ad)}$$

Antiderivative was successfully verified.

[In] Int[(x^m*(e+f*x)^n)/((a+b*x)*(c+d*x)),x]

[Out] (b*x^(1+m)*(e+f*x)^n*AppellF1[1+m, -n, 1, 2+m, -((f*x)/e), -((b*x)/a)]/(a*(b*c - a*d)*(1+m)*(1+(f*x)/e)^n) - (d*x^(1+m)*(e+f*x)^n*AppellF1[1+m, -n, 1, 2+m, -((f*x)/e), -((d*x)/c)]/(c*(b*c - a*d)*(1+m)*(1+(f*x)/e)^n)

Rule 180

Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_)*((e_.) + (f_.)*(x_))^(p_)*((g_.) + (h_.)*(x_))^(q_), x_Symbol] := Int[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n*(e + f*x)^p*(g + h*x)^q, x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n}, x] && IntegersQ[p, q]

Rule 135

Int[((b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_)*((e_.) + (f_.)*(x_))^(p_), x_Symbol] := Dist[(c^IntPart[n]*(c + d*x)^FracPart[n]]/(1 + (d*x)/c)^FracPart[n], Int[(b*x)^m*(1 + (d*x)/c)^n*(e + f*x)^p, x], x] /; FreeQ[{b, c, d, e,

f, m, n, p}, x] && !IntegerQ[m] && !IntegerQ[n] && !GtQ[c, 0]

Rule 133

Int[((b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_)*((e_) + (f_.)*(x_))^(p_), x_ Symbol] :> Simp[(c^n*e^p*(b*x)^(m + 1)*AppellF1[m + 1, -n, -p, m + 2, -((d*x)/c), -((f*x)/e)]]/(b*(m + 1)), x] /; FreeQ[{b, c, d, e, f, m, n, p}, x] && !IntegerQ[m] && !IntegerQ[n] && GtQ[c, 0] && (IntegerQ[p] || GtQ[e, 0])

Rubi steps

$$\begin{aligned} \int \frac{x^m(e+fx)^n}{(a+bx)(c+dx)} dx &= \int \left(\frac{bx^m(e+fx)^n}{(bc-ad)(a+bx)} - \frac{dx^m(e+fx)^n}{(bc-ad)(c+dx)} \right) dx \\ &= \frac{b \int \frac{x^m(e+fx)^n}{a+bx} dx}{bc-ad} - \frac{d \int \frac{x^m(e+fx)^n}{c+dx} dx}{bc-ad} \\ &= \frac{\left(b(e+fx)^n \left(1 + \frac{fx}{e} \right)^{-n} \right) \int \frac{x^m \left(1 + \frac{fx}{e} \right)^n}{a+bx} dx}{bc-ad} - \frac{\left(d(e+fx)^n \left(1 + \frac{fx}{e} \right)^{-n} \right) \int \frac{x^m \left(1 + \frac{fx}{e} \right)^n}{c+dx} dx}{bc-ad} \\ &= \frac{bx^{1+m}(e+fx)^n \left(1 + \frac{fx}{e} \right)^{-n} F_1 \left(1+m; -n, 1; 2+m; -\frac{fx}{e}, -\frac{bx}{a} \right)}{a(bc-ad)(1+m)} - \frac{dx^{1+m}(e+fx)^n \left(1 + \frac{fx}{e} \right)^{-n} F_1 \left(1+m; -n, 1; 2+m; -\frac{fx}{e}, -\frac{dx}{c} \right)}{c(bc-ad)(1+m)} \end{aligned}$$

Mathematica [A] time = 0.216623, size = 104, normalized size = 0.74

$$\frac{x^{m+1}(e+fx)^n \left(\frac{fx}{e} + 1 \right)^{-n} \left(adF_1 \left(m+1; -n, 1; m+2; -\frac{fx}{e}, -\frac{dx}{c} \right) - bcF_1 \left(m+1; -n, 1; m+2; -\frac{fx}{e}, -\frac{bx}{a} \right) \right)}{ac(m+1)(ad-bc)}$$

Antiderivative was successfully verified.

[In] Integrate[(x^m*(e + f*x)^n)/((a + b*x)*(c + d*x)),x]

[Out] (x^(1 + m)*(e + f*x)^n*(-(b*c*AppellF1[1 + m, -n, 1, 2 + m, -((f*x)/e), -((b*x)/a)]) + a*d*AppellF1[1 + m, -n, 1, 2 + m, -((f*x)/e), -((d*x)/c)])))/(a*c*(-(b*c) + a*d)*(1 + m)*(1 + (f*x)/e)^n)

Maple [F] time = 0.066, size = 0, normalized size = 0.

$$\int \frac{(fx+e)^n x^m}{(bx+a)(dx+c)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `int(x^m*(f*x+e)^n/(b*x+a)/(d*x+c),x)`

[Out] `int(x^m*(f*x+e)^n/(b*x+a)/(d*x+c),x)`

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(fx + e)^n x^m}{(bx + a)(dx + c)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate(x^m*(f*x+e)^n/(b*x+a)/(d*x+c),x, algorithm="maxima")`

[Out] `integrate((f*x + e)^n*x^m/((b*x + a)*(d*x + c)), x)`

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{(fx + e)^n x^m}{bdx^2 + ac + (bc + ad)x}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate(x^m*(f*x+e)^n/(b*x+a)/(d*x+c),x, algorithm="fricas")`

[Out] `integral((f*x + e)^n*x^m/(b*d*x^2 + a*c + (b*c + a*d)*x), x)`

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate(x**m*(f*x+e)**n/(b*x+a)/(d*x+c),x)`

[Out] Timed out

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(fx + e)^n x^m}{(bx + a)(dx + c)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^m*(f*x+e)^n/(b*x+a)/(d*x+c),x, algorithm="giac")

[Out] integrate((f*x + e)^n*x^m/((b*x + a)*(d*x + c)), x)

3.124 $\int (a + bx)^m (c + dx)^n (e + fx)(g + hx) dx$

Optimal. Leaf size=266

$$\frac{(a + bx)^{m+1} (c + dx)^n \left(\frac{b(c+dx)}{bc-ad} \right)^{-n} {}_2F_1 \left(m+1, -n; m+2; -\frac{d(a+bx)}{bc-ad} \right) (a^2 d^2 f h (n+1)(n+2) + abd(n+1)(2c f h(m+1) - d(m+1)(n+2))}{b^3 d^2 (m+1)(m+n+2)}$$

[Out] -(((a + b*x)^(1 + m)*(c + d*x)^(1 + n)*(b*c*f*h*(2 + m) + a*d*f*h*(2 + n) - b*d*(f*g + e*h)*(3 + m + n) - b*d*f*h*(2 + m + n)*x))/(b^2*d^2*(2 + m + n)*(3 + m + n))) + ((a^2*d^2*f*h*(1 + n)*(2 + n) + a*b*d*(1 + n)*(2*c*f*h*(1 + m) - d*(f*g + e*h)*(3 + m + n)) + b^2*(c^2*f*h*(1 + m)*(2 + m) - c*d*(f*g + e*h)*(1 + m)*(3 + m + n) + d^2*e*g*(2 + m + n)*(3 + m + n)))*(a + b*x)^(1 + m)*(c + d*x)^n*Hypergeometric2F1[1 + m, -n, 2 + m, -(d*(a + b*x))/(b*c - a*d)))/(b^3*d^2*(1 + m)*(2 + m + n)*(3 + m + n)*((b*(c + d*x))/(b*c - a*d))^n)

Rubi [A] time = 0.165118, antiderivative size = 266, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.12$, Rules used = {147, 70, 69}

$$\frac{(a + bx)^{m+1} (c + dx)^n \left(\frac{b(c+dx)}{bc-ad} \right)^{-n} {}_2F_1 \left(m+1, -n; m+2; -\frac{d(a+bx)}{bc-ad} \right) (a^2 d^2 f h (n+1)(n+2) + abd(n+1)(2c f h(m+1) - d(m+1)(n+2))}{b^3 d^2 (m+1)(m+n+2)}$$

Antiderivative was successfully verified.

[In] Int[(a + b*x)^m*(c + d*x)^n*(e + f*x)*(g + h*x),x]

[Out] -(((a + b*x)^(1 + m)*(c + d*x)^(1 + n)*(b*c*f*h*(2 + m) + a*d*f*h*(2 + n) - b*d*(f*g + e*h)*(3 + m + n) - b*d*f*h*(2 + m + n)*x))/(b^2*d^2*(2 + m + n)*(3 + m + n))) + ((a^2*d^2*f*h*(1 + n)*(2 + n) + a*b*d*(1 + n)*(2*c*f*h*(1 + m) - d*(f*g + e*h)*(3 + m + n)) + b^2*(c^2*f*h*(1 + m)*(2 + m) - c*d*(f*g + e*h)*(1 + m)*(3 + m + n) + d^2*e*g*(2 + m + n)*(3 + m + n)))*(a + b*x)^(1 + m)*(c + d*x)^n*Hypergeometric2F1[1 + m, -n, 2 + m, -(d*(a + b*x))/(b*c - a*d)))/(b^3*d^2*(1 + m)*(2 + m + n)*(3 + m + n)*((b*(c + d*x))/(b*c - a*d))^n)

Rule 147

Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))*(g_.) + (h_.)*(x_)), x_Symbol] := -Simp[((a*d*f*h*(n + 2) + b*c*f*h*(m

```

+ 2) - b*d*(f*g + e*h)*(m + n + 3) - b*d*f*h*(m + n + 2)*x*(a + b*x)^(m +
1)*(c + d*x)^(n + 1))/(b^2*d^2*(m + n + 2)*(m + n + 3)), x] + Dist[(a^2*d^2
*f*h*(n + 1)*(n + 2) + a*b*d*(n + 1)*(2*c*f*h*(m + 1) - d*(f*g + e*h)*(m +
n + 3)) + b^2*(c^2*f*h*(m + 1)*(m + 2) - c*d*(f*g + e*h)*(m + 1)*(m + n + 3
) + d^2*e*g*(m + n + 2)*(m + n + 3)))/(b^2*d^2*(m + n + 2)*(m + n + 3)), In
t[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n},
x] && NeQ[m + n + 2, 0] && NeQ[m + n + 3, 0]

```

Rule 70

```

Int[((a_) + (b_)*(x_))^(m_)*((c_) + (d_)*(x_))^(n_), x_Symbol] := Dist[(c
+ d*x)^FracPart[n]/((b/(b*c - a*d))^IntPart[n]*((b*(c + d*x))/(b*c - a*d))
^FracPart[n]), Int[(a + b*x)^m*Simp[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)
, x]^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && !In
tegerQ[m] && !IntegerQ[n] && (RationalQ[m] || !SimplerQ[n + 1, m + 1])

```

Rule 69

```

Int[((a_) + (b_)*(x_))^(m_)*((c_) + (d_)*(x_))^(n_), x_Symbol] := Simp[((
a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a + b*x))/(b*c -
a*d))]/(b*(m + 1)*(b/(b*c - a*d))^n), x] /; FreeQ[{a, b, c, d, m, n}, x]
&& NeQ[b*c - a*d, 0] && !IntegerQ[m] && !IntegerQ[n] && GtQ[b/(b*c - a*d)
, 0] && (RationalQ[m] || !(RationalQ[n] && GtQ[-(d/(b*c - a*d)), 0]))

```

Rubi steps

$$\begin{aligned}
\int (a + bx)^m (c + dx)^n (e + fx)(g + hx) dx &= -\frac{(a + bx)^{1+m} (c + dx)^{1+n} (bcfh(2 + m) + adfh(2 + n) - bd(fg + eh)(3 + m + n))}{b^2 d^2 (2 + m + n)(3 + m + n)} \\
&= -\frac{(a + bx)^{1+m} (c + dx)^{1+n} (bcfh(2 + m) + adfh(2 + n) - bd(fg + eh)(3 + m + n))}{b^2 d^2 (2 + m + n)(3 + m + n)} \\
&= -\frac{(a + bx)^{1+m} (c + dx)^{1+n} (bcfh(2 + m) + adfh(2 + n) - bd(fg + eh)(3 + m + n))}{b^2 d^2 (2 + m + n)(3 + m + n)}
\end{aligned}$$

Mathematica [A] time = 0.235778, size = 195, normalized size = 0.73

$$\frac{(a + bx)^{m+1} (c + dx)^n \left(\frac{b(c+dx)}{bc-ad}\right)^{-n} \left(b \left(b(de - cf)(dg - ch) {}_2F_1\left(m + 1, -n; m + 2; \frac{d(a+bx)}{ad-bc}\right) - (bc - ad)(2cfh - d(eh + fg))\right) {}_2F_1\left(m + 1, -n; m + 2; \frac{d(a+bx)}{ad-bc}\right) - (bc - ad)(2cfh - d(eh + fg))\right)}{b^3 d^2 (m + 1)}$$

Antiderivative was successfully verified.

[In] Integrate[(a + b*x)^m*(c + d*x)^n*(e + f*x)*(g + h*x),x]

[Out] ((a + b*x)^(1 + m)*(c + d*x)^n*((b*c - a*d)^2*f*h*Hypergeometric2F1[1 + m, -2 - n, 2 + m, (d*(a + b*x))/(-(b*c) + a*d)] + b*(-((b*c - a*d)*(2*c*f*h - d*(f*g + e*h))*Hypergeometric2F1[1 + m, -1 - n, 2 + m, (d*(a + b*x))/(-(b*c) + a*d)]) + b*(d*e - c*f)*(d*g - c*h)*Hypergeometric2F1[1 + m, -n, 2 + m, (d*(a + b*x))/(-(b*c) + a*d)])))/(b^3*d^2*(1 + m)*((b*(c + d*x))/(b*c - a*d))^n)

Maple [F] time = 0.065, size = 0, normalized size = 0.

$$\int (bx + a)^m (dx + c)^n (fx + e)(hx + g) dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b*x+a)^m*(d*x+c)^n*(f*x+e)*(h*x+g),x)

[Out] int((b*x+a)^m*(d*x+c)^n*(f*x+e)*(h*x+g),x)

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (fx + e)(hx + g)(bx + a)^m(dx + c)^n dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b*x+a)^m*(d*x+c)^n*(f*x+e)*(h*x+g),x, algorithm="maxima")

[Out] integrate((f*x + e)*(h*x + g)*(b*x + a)^m*(d*x + c)^n, x)

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}((f h x^2 + e g + (f g + e h) x)(b x + a)^m (d x + c)^n, x)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b*x+a)^m*(d*x+c)^n*(f*x+e)*(h*x+g),x, algorithm="fricas")

[Out] `integral((f*h*x^2 + e*g + (f*g + e*h)*x)*(b*x + a)^m*(d*x + c)^n, x)`

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((b*x+a)**m*(d*x+c)**n*(f*x+e)*(h*x+g), x)`

[Out] Timed out

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (fx + e)(hx + g)(bx + a)^m(dx + c)^n dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((b*x+a)^m*(d*x+c)^n*(f*x+e)*(h*x+g), x, algorithm="giac")`

[Out] `integrate((f*x + e)*(h*x + g)*(b*x + a)^m*(d*x + c)^n, x)`

3.125 $\int (a + bx)^m (c + dx)^{1-m} (e + fx)(g + hx) dx$

Optimal. Leaf size=245

$$\frac{(bc - ad)(a + bx)^{m+1}(c + dx)^{-m} \left(\frac{b(c+dx)}{bc-ad}\right)^m {}_2F_1\left(m-1, m+1; m+2; -\frac{d(a+bx)}{bc-ad}\right) (a^2 d^2 f h (m^2 - 5m + 6) - 2abd(2-m)(2d(e + fx) + g))}{12b^4 d^2 (m+1)}$$

[Out] $((a + b*x)^{(1 + m)}*(c + d*x)^{(2 - m)}*(4*b*d*(f*g + e*h) - a*d*f*h*(3 - m) - b*c*f*h*(2 + m) + 3*b*d*f*h*x))/(12*b^2*d^2) + ((b*c - a*d)*(a^2*d^2*f*h*(6 - 5*m + m^2) - 2*a*b*d*(2 - m)*(2*d*(f*g + e*h) - c*f*h*(1 + m)) + b^2*(12*d^2*e*g - 4*c*d*(f*g + e*h)*(1 + m) + c^2*f*h*(2 + 3*m + m^2)))*(a + b*x)^{(1 + m)}*((b*(c + d*x))/(b*c - a*d))^m*Hypergeometric2F1[-1 + m, 1 + m, 2 + m, -((d*(a + b*x))/(b*c - a*d))])/(12*b^4*d^2*(1 + m)*(c + d*x)^m)$

Rubi [A] time = 0.154641, antiderivative size = 245, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.103$, Rules used = {147, 70, 69}

$$\frac{(bc - ad)(a + bx)^{m+1}(c + dx)^{-m} \left(\frac{b(c+dx)}{bc-ad}\right)^m {}_2F_1\left(m-1, m+1; m+2; -\frac{d(a+bx)}{bc-ad}\right) (a^2 d^2 f h (m^2 - 5m + 6) - 2abd(2-m)(2d(e + fx) + g))}{12b^4 d^2 (m+1)}$$

Antiderivative was successfully verified.

[In] Int[(a + b*x)^m*(c + d*x)^(1 - m)*(e + f*x)*(g + h*x), x]

[Out] $((a + b*x)^{(1 + m)}*(c + d*x)^{(2 - m)}*(4*b*d*(f*g + e*h) - a*d*f*h*(3 - m) - b*c*f*h*(2 + m) + 3*b*d*f*h*x))/(12*b^2*d^2) + ((b*c - a*d)*(a^2*d^2*f*h*(6 - 5*m + m^2) - 2*a*b*d*(2 - m)*(2*d*(f*g + e*h) - c*f*h*(1 + m)) + b^2*(12*d^2*e*g - 4*c*d*(f*g + e*h)*(1 + m) + c^2*f*h*(2 + 3*m + m^2)))*(a + b*x)^{(1 + m)}*((b*(c + d*x))/(b*c - a*d))^m*Hypergeometric2F1[-1 + m, 1 + m, 2 + m, -((d*(a + b*x))/(b*c - a*d))])/(12*b^4*d^2*(1 + m)*(c + d*x)^m)$

Rule 147

Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))*((g_.) + (h_.)*(x_)), x_Symbol] := -Simp[((a*d*f*h*(n + 2) + b*c*f*h*(m + 2) - b*d*(f*g + e*h)*(m + n + 3) - b*d*f*h*(m + n + 2)*x)*(a + b*x)^(m + 1)*(c + d*x)^(n + 1))/(b^2*d^2*(m + n + 2)*(m + n + 3)), x] + Dist[(a^2*d^2*f*h*(n + 1)*(n + 2) + a*b*d*(n + 1)*(2*c*f*h*(m + 1) - d*(f*g + e*h)*(m + n + 3)) + b^2*(c^2*f*h*(m + 1)*(m + 2) - c*d*(f*g + e*h)*(m + 1)*(m + n + 3

```
) + d^2*e*g*(m + n + 2)*(m + n + 3))/(b^2*d^2*(m + n + 2)*(m + n + 3)), Int[(a + b*x)^m*(c + d*x)^n, x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n}, x] && NeQ[m + n + 2, 0] && NeQ[m + n + 3, 0]
```

Rule 70

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] := Dist[(c + d*x)^FracPart[n]/((b/(b*c - a*d))^IntPart[n]*((b*(c + d*x))/(b*c - a*d))^FracPart[n]), Int[(a + b*x)^m*Simp[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)], x]^n, x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && !IntegerQ[m] && !IntegerQ[n] && (RationalQ[m] || !SimplerQ[n + 1, m + 1])
```

Rule 69

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] := Simp[((a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -(d*(a + b*x))/(b*c - a*d)])/((b*(m + 1)*(b/(b*c - a*d))^n), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && !IntegerQ[m] && !IntegerQ[n] && GtQ[b/(b*c - a*d), 0] && (RationalQ[m] || !(RationalQ[n] && GtQ[-(d/(b*c - a*d)), 0]))
```

Rubi steps

$$\begin{aligned} \int (a + bx)^m (c + dx)^{1-m} (e + fx)(g + hx) dx &= \frac{(a + bx)^{1+m} (c + dx)^{2-m} (4bd(fg + eh) - adfh(3 - m) - bcfh(2 + m) + 3ba)}{12b^2d^2} \\ &= \frac{(a + bx)^{1+m} (c + dx)^{2-m} (4bd(fg + eh) - adfh(3 - m) - bcfh(2 + m) + 3ba)}{12b^2d^2} \\ &= \frac{(a + bx)^{1+m} (c + dx)^{2-m} (4bd(fg + eh) - adfh(3 - m) - bcfh(2 + m) + 3ba)}{12b^2d^2} \end{aligned}$$

Mathematica [A] time = 0.260858, size = 195, normalized size = 0.8

$$\frac{(a + bx)^{m+1} (c + dx)^{1-m} \left(\frac{b(c+dx)}{bc-ad}\right)^{m-1} \left(b \left(b(de - cf)(dg - ch) {}_2F_1\left(m - 1, m + 1; m + 2; \frac{d(a+bx)}{ad-bc}\right) - (bc - ad)(2cfh - d(eh + \dots)\right)}{b^3d^2(m + 1)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x)^m*(c + d*x)^(1 - m)*(e + f*x)*(g + h*x), x]
```

```
[Out] ((a + b*x)^(1 + m)*(c + d*x)^(1 - m)*((b*(c + d*x))/(b*c - a*d))^(-1 + m)*
(b*c - a*d)^2*f*h*Hypergeometric2F1[-3 + m, 1 + m, 2 + m, (d*(a + b*x))/(-
b*c) + a*d] + b*(-((b*c - a*d)*(2*c*f*h - d*(f*g + e*h))*Hypergeometric2F1
[-2 + m, 1 + m, 2 + m, (d*(a + b*x))/(-(b*c) + a*d)]) + b*(d*e - c*f)*(d*g
- c*h)*Hypergeometric2F1[-1 + m, 1 + m, 2 + m, (d*(a + b*x))/(-(b*c) + a*d
]))) / (b^3*d^2*(1 + m))
```

Maple [F] time = 0.061, size = 0, normalized size = 0.

$$\int (bx + a)^m (dx + c)^{1-m} (fx + e)(hx + g) dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x+a)^m*(d*x+c)^(1-m)*(f*x+e)*(h*x+g), x)
```

```
[Out] int((b*x+a)^m*(d*x+c)^(1-m)*(f*x+e)*(h*x+g), x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (fx + e)(hx + g)(bx + a)^m (dx + c)^{-m+1} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^m*(d*x+c)^(1-m)*(f*x+e)*(h*x+g), x, algorithm="maxima")
```

```
[Out] integrate((f*x + e)*(h*x + g)*(b*x + a)^m*(d*x + c)^(-m + 1), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}((f*x^2 + e*g + (f*g + e*h)*x)(b*x + a)^m (d*x + c)^{-m+1}, x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^m*(d*x+c)^(1-m)*(f*x+e)*(h*x+g), x, algorithm="fricas")
```

```
[Out] integral((f*h*x^2 + e*g + (f*g + e*h)*x)*(b*x + a)^m*(d*x + c)^(-m + 1), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((b*x+a)**m*(d*x+c)**(1-m)*(f*x+e)*(h*x+g), x)`

[Out] Timed out

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (fx + e)(hx + g)(bx + a)^m(dx + c)^{-m+1} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((b*x+a)^m*(d*x+c)^(1-m)*(f*x+e)*(h*x+g), x, algorithm="giac")`

[Out] `integrate((f*x + e)*(h*x + g)*(b*x + a)^m*(d*x + c)^(-m + 1), x)`

3.126 $\int (a + bx)^m (c + dx)^{-m} (e + fx)(g + hx) dx$

Optimal. Leaf size=235

$$\frac{(a + bx)^{m+1} (c + dx)^{-m} \left(\frac{b(c+dx)}{bc-ad} \right)^m {}_2F_1 \left(m, m+1; m+2; -\frac{d(a+bx)}{bc-ad} \right) (a^2 d^2 f h (m^2 - 3m + 2) - abd(1-m)(3d(eh + fg) - 2cf)}{6b^3 d^2 (m+1)}$$

[Out] $((a + b*x)^{(1 + m)}*(c + d*x)^{(1 - m)}*(3*b*d*(f*g + e*h) - a*d*f*h*(2 - m) - b*c*f*h*(2 + m) + 2*b*d*f*h*x)/(6*b^2*d^2) + ((a^2*d^2*f*h*(2 - 3*m + m^2) - a*b*d*(1 - m)*(3*d*(f*g + e*h) - 2*c*f*h*(1 + m)) + b^2*(6*d^2*e*g - 3*c*d*(f*g + e*h)*(1 + m) + c^2*f*h*(2 + 3*m + m^2)))*(a + b*x)^{(1 + m)}*((b*(c + d*x))/(b*c - a*d))^m*Hypergeometric2F1[m, 1 + m, 2 + m, -((d*(a + b*x))/(b*c - a*d))]/(6*b^3*d^2*(1 + m)*(c + d*x)^m)$

Rubi [A] time = 0.13751, antiderivative size = 235, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.111$, Rules used = {147, 70, 69}

$$\frac{(a + bx)^{m+1} (c + dx)^{-m} \left(\frac{b(c+dx)}{bc-ad} \right)^m {}_2F_1 \left(m, m+1; m+2; -\frac{d(a+bx)}{bc-ad} \right) (a^2 d^2 f h (m^2 - 3m + 2) - abd(1-m)(3d(eh + fg) - 2cf)}{6b^3 d^2 (m+1)}$$

Antiderivative was successfully verified.

[In] Int[((a + b*x)^m*(e + f*x)*(g + h*x))/(c + d*x)^m,x]

[Out] $((a + b*x)^{(1 + m)}*(c + d*x)^{(1 - m)}*(3*b*d*(f*g + e*h) - a*d*f*h*(2 - m) - b*c*f*h*(2 + m) + 2*b*d*f*h*x)/(6*b^2*d^2) + ((a^2*d^2*f*h*(2 - 3*m + m^2) - a*b*d*(1 - m)*(3*d*(f*g + e*h) - 2*c*f*h*(1 + m)) + b^2*(6*d^2*e*g - 3*c*d*(f*g + e*h)*(1 + m) + c^2*f*h*(2 + 3*m + m^2)))*(a + b*x)^{(1 + m)}*((b*(c + d*x))/(b*c - a*d))^m*Hypergeometric2F1[m, 1 + m, 2 + m, -((d*(a + b*x))/(b*c - a*d))]/(6*b^3*d^2*(1 + m)*(c + d*x)^m)$

Rule 147

Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))*((g_.) + (h_.)*(x_)), x_Symbol] := -Simp[((a*d*f*h*(n + 2) + b*c*f*h*(m + 2) - b*d*(f*g + e*h)*(m + n + 3) - b*d*f*h*(m + n + 2)*x)*(a + b*x)^(m + 1)*(c + d*x)^(n + 1))/(b^2*d^2*(m + n + 2)*(m + n + 3)), x] + Dist[(a^2*d^2*f*h*(n + 1)*(n + 2) + a*b*d*(n + 1)*(2*c*f*h*(m + 1) - d*(f*g + e*h)*(m + n + 3)) + b^2*(c^2*f*h*(m + 1)*(m + 2) - c*d*(f*g + e*h)*(m + 1)*(m + n + 3

```
) + d^2*e*g*(m + n + 2)*(m + n + 3))/(b^2*d^2*(m + n + 2)*(m + n + 3)), Int[(a + b*x)^m*(c + d*x)^n, x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n}, x] && NeQ[m + n + 2, 0] && NeQ[m + n + 3, 0]
```

Rule 70

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] := Dist[(c + d*x)^FracPart[n]/((b/(b*c - a*d))^IntPart[n]*((b*(c + d*x))/(b*c - a*d))^FracPart[n]), Int[(a + b*x)^m*Simp[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d), x]^n, x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && !IntegerQ[m] && !IntegerQ[n] && (RationalQ[m] || !SimplerQ[n + 1, m + 1])
```

Rule 69

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] := Simp[((a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a + b*x))/(b*c - a*d))]/(b*(m + 1)*(b/(b*c - a*d))^n), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && !IntegerQ[m] && !IntegerQ[n] && GtQ[b/(b*c - a*d), 0] && (RationalQ[m] || !(RationalQ[n] && GtQ[-(d/(b*c - a*d)), 0]))
```

Rubi steps

$$\begin{aligned} \int (a + bx)^m (c + dx)^{-m} (e + fx)(g + hx) dx &= \frac{(a + bx)^{1+m} (c + dx)^{1-m} (3bd(fg + eh) - adfh(2 - m) - bcfh(2 + m) + 2bd)}{6b^2d^2} \\ &= \frac{(a + bx)^{1+m} (c + dx)^{1-m} (3bd(fg + eh) - adfh(2 - m) - bcfh(2 + m) + 2bd)}{6b^2d^2} \\ &= \frac{(a + bx)^{1+m} (c + dx)^{1-m} (3bd(fg + eh) - adfh(2 - m) - bcfh(2 + m) + 2bd)}{6b^2d^2} \end{aligned}$$

Mathematica [A] time = 0.20556, size = 189, normalized size = 0.8

$$\frac{(a + bx)^{m+1} (c + dx)^{-m} \left(\frac{b(c+dx)}{bc-ad} \right)^m \left(b \left(b(de - cf)(dg - ch) {}_2F_1 \left(m, m + 1; m + 2; \frac{d(a+bx)}{ad-bc} \right) - (bc - ad)(2cfh - d(eh + fg)) \right)}{b^3d^2(m + 1)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x)^m*(e + f*x)*(g + h*x))/(c + d*x)^m,x]
```

[Out] $((a + b*x)^{(1 + m)}*((b*(c + d*x))/(b*c - a*d))^m*((b*c - a*d)^{2*f*h}*Hypergeometric2F1[-2 + m, 1 + m, 2 + m, (d*(a + b*x))/(-(b*c) + a*d)] + b*(-((b*c - a*d)*(2*c*f*h - d*(f*g + e*h))*Hypergeometric2F1[-1 + m, 1 + m, 2 + m, (d*(a + b*x))/(-(b*c) + a*d)]) + b*(d*e - c*f)*(d*g - c*h)*Hypergeometric2F1[m, 1 + m, 2 + m, (d*(a + b*x))/(-(b*c) + a*d)])))/(b^3*d^2*(1 + m)*(c + d*x)^m)$

Maple [F] time = 0.061, size = 0, normalized size = 0.

$$\int \frac{(hx + g)(fx + e)(bx + a)^m}{(dx + c)^m} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `int((b*x+a)^m*(f*x+e)*(h*x+g)/((d*x+c)^m),x)`

[Out] `int((b*x+a)^m*(f*x+e)*(h*x+g)/((d*x+c)^m),x)`

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(fx + e)(hx + g)(bx + a)^m}{(dx + c)^m} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((b*x+a)^m*(f*x+e)*(h*x+g)/((d*x+c)^m),x, algorithm="maxima")`

[Out] `integrate((f*x + e)*(h*x + g)*(b*x + a)^m/(d*x + c)^m, x)`

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{(fhx^2 + eg + (fg + eh)x)(bx + a)^m}{(dx + c)^m}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((b*x+a)^m*(f*x+e)*(h*x+g)/((d*x+c)^m),x, algorithm="fricas")`

[Out] `integral((f*h*x^2 + e*g + (f*g + e*h)*x)*(b*x + a)^m/(d*x + c)^m, x)`

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((b*x+a)**m*(f*x+e)*(h*x+g)/((d*x+c)**m), x)`

[Out] Timed out

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(fx + e)(hx + g)(bx + a)^m}{(dx + c)^m} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((b*x+a)^m*(f*x+e)*(h*x+g)/((d*x+c)^m), x, algorithm="giac")`

[Out] `integrate((f*x + e)*(h*x + g)*(b*x + a)^m/(d*x + c)^m, x)`

3.127 $\int (a + bx)^m (c + dx)^{-1-m} (e + fx)(g + hx) dx$

Optimal. Leaf size=261

$$\frac{(a + bx)^{m+1}(c + dx)^{-m} (-cd(afhm + 2b(eh + fg)) + dfhm x(bc - ad) + bc^2 fh(m + 2) + 2bd^2 eg)}{2bd^2 m(bc - ad)} - \frac{(a + bx)^{m+1}(c + dx)^{-m}}{2bd^2 m(bc - ad)}$$

```
[Out] ((a + b*x)^(1 + m)*(2*b*d^2*e*g + b*c^2*f*h*(2 + m) - c*d*(2*b*(f*g + e*h)
+ a*f*h*m) + d*(b*c - a*d)*f*h*m*x))/(2*b*d^2*(b*c - a*d)*m*(c + d*x)^m) -
((b^2*c^2*f*h*(1 + m)*(2 + m) - 2*b*c*d*(1 + m)*(b*f*g + b*e*h + a*f*h*m) +
d^2*(2*b^2*e*g + 2*a*b*(f*g + e*h)*m - a^2*f*h*(1 - m)*m))*(a + b*x)^(1 +
m)*((b*(c + d*x))/(b*c - a*d))^m*Hypergeometric2F1[m, 1 + m, 2 + m, -((d*(a
+ b*x))/(b*c - a*d))])/(2*b^2*d^2*(b*c - a*d)*m*(1 + m)*(c + d*x)^m)
```

Rubi [A] time = 0.186199, antiderivative size = 261, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.103$, Rules used = {146, 70, 69}

$$\frac{(a + bx)^{m+1}(c + dx)^{-m} (-cd(afhm + 2b(eh + fg)) + dfhm x(bc - ad) + bc^2 fh(m + 2) + 2bd^2 eg)}{2bd^2 m(bc - ad)} - \frac{(a + bx)^{m+1}(c + dx)^{-m}}{2bd^2 m(bc - ad)}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x)^m*(c + d*x)^(-1 - m)*(e + f*x)*(g + h*x), x]
```

```
[Out] ((a + b*x)^(1 + m)*(2*b*d^2*e*g + b*c^2*f*h*(2 + m) - c*d*(2*b*(f*g + e*h)
+ a*f*h*m) + d*(b*c - a*d)*f*h*m*x))/(2*b*d^2*(b*c - a*d)*m*(c + d*x)^m) -
((b^2*c^2*f*h*(1 + m)*(2 + m) - 2*b*c*d*(1 + m)*(b*f*g + b*e*h + a*f*h*m) +
d^2*(2*b^2*e*g + 2*a*b*(f*g + e*h)*m - a^2*f*h*(1 - m)*m))*(a + b*x)^(1 +
m)*((b*(c + d*x))/(b*c - a*d))^m*Hypergeometric2F1[m, 1 + m, 2 + m, -((d*(a
+ b*x))/(b*c - a*d))])/(2*b^2*d^2*(b*c - a*d)*m*(1 + m)*(c + d*x)^m)
```

Rule 146

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_)*((e_.) + (f_.)*(x_))
)*((g_.) + (h_.)*(x_)), x_Symbol] := Simp[((a^2*d*f*h*(n + 2) + b^2*d*e*g*(
m + n + 3) + a*b*(c*f*h*(m + 1) - d*(f*g + e*h)*(m + n + 3)) + b*f*h*(b*c -
a*d)*(m + 1)*x)*(a + b*x)^(m + 1)*(c + d*x)^(n + 1))/(b^2*d*(b*c - a*d)*(m
+ 1)*(m + n + 3)), x] - Dist[(a^2*d^2*f*h*(n + 1)*(n + 2) + a*b*d*(n + 1)*
(2*c*f*h*(m + 1) - d*(f*g + e*h)*(m + n + 3)) + b^2*(c^2*f*h*(m + 1)*(m + 2
```

```
) - c*d*(f*g + e*h)*(m + 1)*(m + n + 3) + d^2*e*g*(m + n + 2)*(m + n + 3))
/(b^2*d*(b*c - a*d)*(m + 1)*(m + n + 3)), Int[(a + b*x)^(m + 1)*(c + d*x)^n
, x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n}, x] && ((GeQ[m, -2] && LtQ
[m, -1]) || SumSimplerQ[m, 1]) && NeQ[m, -1] && NeQ[m + n + 3, 0]
```

Rule 70

```
Int[((a_) + (b_)*(x_))^(m_)*((c_) + (d_)*(x_))^(n_), x_Symbol] := Dist[(c
+ d*x)^FracPart[n]/((b/(b*c - a*d))^IntPart[n]*((b*(c + d*x))/(b*c - a*d))
^FracPart[n]), Int[(a + b*x)^m*Simp[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)
, x]^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && !In
tegerQ[m] && !IntegerQ[n] && (RationalQ[m] || !SimplerQ[n + 1, m + 1])
```

Rule 69

```
Int[((a_) + (b_)*(x_))^(m_)*((c_) + (d_)*(x_))^(n_), x_Symbol] := Simp[((
a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a + b*x))/(b*c -
a*d))]/(b*(m + 1)*(b/(b*c - a*d))^n), x] /; FreeQ[{a, b, c, d, m, n}, x]
&& NeQ[b*c - a*d, 0] && !IntegerQ[m] && !IntegerQ[n] && GtQ[b/(b*c - a*d)
, 0] && (RationalQ[m] || !(RationalQ[n] && GtQ[-(d/(b*c - a*d)), 0]))
```

Rubi steps

$$\begin{aligned} \int (a + bx)^m (c + dx)^{-1-m} (e + fx)(g + hx) dx &= \frac{(a + bx)^{1+m} (c + dx)^{-m} (2bd^2eg + bc^2fh(2 + m) - cd(2b(fg + eh) + afhm))}{2bd^2(bc - ad)m} \\ &= \frac{(a + bx)^{1+m} (c + dx)^{-m} (2bd^2eg + bc^2fh(2 + m) - cd(2b(fg + eh) + afhm))}{2bd^2(bc - ad)m} \\ &= \frac{(a + bx)^{1+m} (c + dx)^{-m} (2bd^2eg + bc^2fh(2 + m) - cd(2b(fg + eh) + afhm))}{2bd^2(bc - ad)m} \end{aligned}$$

Mathematica [A] time = 0.186019, size = 221, normalized size = 0.85

$$\frac{(a + bx)^{m+1} (c + dx)^{-m} \left(\frac{b(c+dx)}{bc-ad} \right)^m {}_2F_1\left(m, m+1; m+2; \frac{d(a+bx)}{ad-bc}\right) (a^2 d^2 fh(m-1)m + 2abdm(d(eh+fg) - cfh(m+1)) + b^2(c^2 fh(m^2+3m+2) - 2cd(m+1)(eh+fg) + afhm))}{2b^2 d^2 m(ad - bc)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x)^m*(c + d*x)^(-1 - m)*(e + f*x)*(g + h*x), x]
```

```
[Out] ((a + b*x)^(1 + m)*(b*(a*d*f*h*m*(c + d*x) - b*(2*d^2*e*g + c^2*f*h*(2 + m)
+ c*d*(-2*f*g - 2*e*h + f*h*m*x))) + ((a^2*d^2*f*h*(-1 + m)*m + 2*a*b*d*m*
(d*(f*g + e*h) - c*f*h*(1 + m)) + b^2*(2*d^2*e*g - 2*c*d*(f*g + e*h)*(1 + m)
) + c^2*f*h*(2 + 3*m + m^2)))*((b*(c + d*x))/(b*c - a*d))^m*Hypergeometric2
F1[m, 1 + m, 2 + m, (d*(a + b*x))/(-(b*c) + a*d)]/(1 + m))/(2*b^2*d^2*(-(
b*c) + a*d)*m*(c + d*x)^m)
```

Maple [F] time = 0.056, size = 0, normalized size = 0.

$$\int (bx + a)^m (dx + c)^{-1-m} (fx + e)(hx + g) dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x+a)^m*(d*x+c)^(-1-m)*(f*x+e)*(h*x+g),x)
```

```
[Out] int((b*x+a)^m*(d*x+c)^(-1-m)*(f*x+e)*(h*x+g),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (fx + e)(hx + g)(bx + a)^m (dx + c)^{-m-1} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^m*(d*x+c)^(-1-m)*(f*x+e)*(h*x+g),x, algorithm="maxima")
```

```
[Out] integrate((f*x + e)*(h*x + g)*(b*x + a)^m*(d*x + c)^(-m - 1), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}((f*hx^2 + e*g + (f*g + e*h)*x)(bx + a)^m (dx + c)^{-m-1}, x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^m*(d*x+c)^(-1-m)*(f*x+e)*(h*x+g),x, algorithm="fricas")
```

```
[Out] integral((f*h*x^2 + e*g + (f*g + e*h)*x)*(b*x + a)^m*(d*x + c)^(-m - 1), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b*x+a)**m*(d*x+c)**(-1-m)*(f*x+e)*(h*x+g), x)

[Out] Timed out

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (fx + e)(hx + g)(bx + a)^m(dx + c)^{-m-1} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b*x+a)^m*(d*x+c)^(-1-m)*(f*x+e)*(h*x+g), x, algorithm="giac")

[Out] integrate((f*x + e)*(h*x + g)*(b*x + a)^m*(d*x + c)^(-m - 1), x)

3.128 $\int (a + bx)^m (c + dx)^{-2-m} (e + fx)(g + hx) dx$

Optimal. Leaf size=203

$$\frac{(a + bx)^{m+1}(c + dx)^{-m-1} \left(-cd(afh(m+1) + b(eh + fg)) + dfh(m+1)x(bc - ad) + bc^2fh(m+2) + bd^2eg \right)}{bd^2(m+1)(bc - ad)} - \frac{(a + bx)^m(c + dx)^{-m}}{bd^2(m+1)(bc - ad)}$$

[Out] $((a + b*x)^{(1 + m)}*(c + d*x)^{(-1 - m)}*(b*d^2*e*g + b*c^2*f*h*(2 + m) - c*d*(b*(f*g + e*h) + a*f*h*(1 + m)) + d*(b*c - a*d)*f*h*(1 + m)*x)/(b*d^2*(b*c - a*d)*(1 + m)) - ((a*d*f*h*m + b*(d*(f*g + e*h) - c*f*h*(2 + m)))*(a + b*x)^m*Hypergeometric2F1[-m, -m, 1 - m, (b*(c + d*x))/(b*c - a*d)]/(b*d^3*m*(-((d*(a + b*x))/(b*c - a*d)))^m*(c + d*x)^m)$

Rubi [A] time = 0.106725, antiderivative size = 205, normalized size of antiderivative = 1.01, number of steps used = 3, number of rules used = 3, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.103$, Rules used = {143, 70, 69}

$$\frac{(a + bx)^{m+1}(c + dx)^{-m-1} \left(-dfh(m+1)x(bc - ad) + acdfh(m+1) - b(c^2fh(m+2) - cd(eh + fg) + d^2eg) \right)}{bd^2(m+1)(bc - ad)} - \frac{(a + bx)^m(c + dx)^{-m}}{bd^2(m+1)(bc - ad)}$$

Antiderivative was successfully verified.

[In] Int[(a + b*x)^m*(c + d*x)^(-2 - m)*(e + f*x)*(g + h*x), x]

[Out] $-(((a + b*x)^{(1 + m)}*(c + d*x)^{(-1 - m)}*(a*c*d*f*h*(1 + m) - b*(d^2*e*g - c*d*(f*g + e*h) + c^2*f*h*(2 + m)) - d*(b*c - a*d)*f*h*(1 + m)*x)/(b*d^2*(b*c - a*d)*(1 + m)) - ((b*d*(f*g + e*h) + a*d*f*h*m - b*c*f*h*(2 + m))*(a + b*x)^m*Hypergeometric2F1[-m, -m, 1 - m, (b*(c + d*x))/(b*c - a*d)]/(b*d^3*m*(-((d*(a + b*x))/(b*c - a*d)))^m*(c + d*x)^m)$

Rule 143

Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_)*((e_.) + (f_.)*(x_))*((g_.) + (h_.)*(x_)), x_Symbol] :> Simp[((b^2*d*e*g - a^2*d*f*h*m - a*b*(d*(f*g + e*h) - c*f*h*(m + 1)) + b*f*h*(b*c - a*d)*(m + 1)*x)*(a + b*x)^(m + 1)*(c + d*x)^(n + 1))/(b^2*d*(b*c - a*d)*(m + 1)), x] + Dist[(a*d*f*h*m + b*(d*(f*g + e*h) - c*f*h*(m + 2)))/(b^2*d), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n}, x] && EqQ[m + n + 2, 0] && NeQ[m, -1] && !(SumSimplerQ[n, 1] && !SumSimplerQ[m, 1])

Rule 70

```
Int[((a_) + (b_)*(x_))^(m_)*((c_) + (d_)*(x_))^(n_), x_Symbol] := Dist[(c
+ d*x)^FracPart[n]/((b/(b*c - a*d))^IntPart[n]*((b*(c + d*x))/(b*c - a*d))
^FracPart[n]), Int[(a + b*x)^m*Simp[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)
, x]^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && !In
tegerQ[m] && !IntegerQ[n] && (RationalQ[m] || !SimplerQ[n + 1, m + 1])
```

Rule 69

```
Int[((a_) + (b_)*(x_))^(m_)*((c_) + (d_)*(x_))^(n_), x_Symbol] := Simp[((
a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a + b*x))/(b*c -
a*d))]/(b*(m + 1)*(b/(b*c - a*d))^n), x] /; FreeQ[{a, b, c, d, m, n}, x]
&& NeQ[b*c - a*d, 0] && !IntegerQ[m] && !IntegerQ[n] && GtQ[b/(b*c - a*d)
, 0] && (RationalQ[m] || !(RationalQ[n] && GtQ[-(d/(b*c - a*d)), 0]))
```

Rubi steps

$$\int (a + bx)^m (c + dx)^{-2-m} (e + fx)(g + hx) dx = -\frac{(a + bx)^{1+m} (c + dx)^{-1-m} (acd fh(1 + m) - b(d^2 eg - cd(fg + eh) + c^2 fh)}{bd^2(bc - ad)(1 + m)}$$

$$= -\frac{(a + bx)^{1+m} (c + dx)^{-1-m} (acd fh(1 + m) - b(d^2 eg - cd(fg + eh) + c^2 fh)}{bd^2(bc - ad)(1 + m)}$$

$$= -\frac{(a + bx)^{1+m} (c + dx)^{-1-m} (acd fh(1 + m) - b(d^2 eg - cd(fg + eh) + c^2 fh)}{bd^2(bc - ad)(1 + m)}$$

Mathematica [A] time = 0.249263, size = 198, normalized size = 0.98

$$\frac{(a + bx)^m (c + dx)^{-m} \left(\frac{(m+1)(bc-ad) \left(\frac{d(a+bx)}{ad-bc} \right)^{-m} {}_2F_1 \left(-m, -m; 1-m; \frac{b(c+dx)}{bc-ad} \right) (-ad fhm + bc fh(m+2) - bd(eh+fg))}{m} - \frac{d(a+bx)(ad fh(m+1)(c+dx) - b(c^2 fh(m+1) + c d^2))}{c+d} \right)}{bd^3(m+1)(bc-ad)}$$

Antiderivative was successfully verified.

[In] Integrate[(a + b*x)^m*(c + d*x)^(-2 - m)*(e + f*x)*(g + h*x), x]

[Out] ((a + b*x)^m*(-((d*(a + b*x)*(a*d*f*h*(1 + m)*(c + d*x) - b*(d^2*e*g + c^2*f*h*(2 + m) + c*d*(-(f*g) - e*h + f*h*(1 + m)*x))))/(c + d*x)) + ((b*c - a*d)*(1 + m)*(-(b*d*(f*g + e*h)) - a*d*f*h*m + b*c*f*h*(2 + m))*Hypergeometric2F1[-m, -m, 1 - m, (b*(c + d*x))/(b*c - a*d)]/(m*((d*(a + b*x))/(-b*c) +

$$a*d))^{m})) / (b*d^3*(b*c - a*d)*(1 + m)*(c + d*x)^m)$$

Maple [F] time = 0.054, size = 0, normalized size = 0.

$$\int (bx + a)^m (dx + c)^{-2-m} (fx + e)(hx + g) dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b*x+a)^m*(d*x+c)^(-2-m)*(f*x+e)*(h*x+g), x)

[Out] int((b*x+a)^m*(d*x+c)^(-2-m)*(f*x+e)*(h*x+g), x)

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (fx + e)(hx + g)(bx + a)^m (dx + c)^{-m-2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b*x+a)^m*(d*x+c)^(-2-m)*(f*x+e)*(h*x+g), x, algorithm="maxima")

[Out] integrate((f*x + e)*(h*x + g)*(b*x + a)^m*(d*x + c)^(-m - 2), x)

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}((f*hx^2 + eg + (fg + eh)*x)(bx + a)^m (dx + c)^{-m-2}, x)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b*x+a)^m*(d*x+c)^(-2-m)*(f*x+e)*(h*x+g), x, algorithm="fricas")

[Out] integral((f*h*x^2 + e*g + (f*g + e*h)*x)*(b*x + a)^m*(d*x + c)^(-m - 2), x)

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((b*x+a)**m*(d*x+c)**(-2-m)*(f*x+e)*(h*x+g),x)`

[Out] Timed out

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (fx + e)(hx + g)(bx + a)^m(dx + c)^{-m-2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((b*x+a)^m*(d*x+c)^(-2-m)*(f*x+e)*(h*x+g),x, algorithm="giac")`

[Out] `integrate((f*x + e)*(h*x + g)*(b*x + a)^m*(d*x + c)^(-m - 2), x)`

3.129 $\int (a + bx)^m (c + dx)^{-3-m} (e + fx)(g + hx) dx$

Optimal. Leaf size=246

$$\frac{fh(a + bx)^{m+3}(c + dx)^{-m} \left(\frac{b(c+dx)}{bc-ad}\right)^m {}_2F_1\left(m + 3, m + 3; m + 4; -\frac{d(a+bx)}{bc-ad}\right)}{(m + 3)(bc - ad)^3} - \frac{(a + bx)^{m+1}(c + dx)^{-m-2} (-bx (a^2dfh(2m + 3))}{(m + 3)(bc - ad)^3}$$

[Out] $-\left(\left((a + b*x)^{(1 + m)}*(c + d*x)^{(-2 - m)}*(a^2*b*c*f*h*m - a^3*d*f*h*(1 + m) - b^3*c*e*g*(2 + m) + a*b^2*(c*(f*g + e*h) + d*e*g*(1 + m)) - b*(a^2*d*f*h*(3 + 2*m) + b^2*(d*e*g + c*(f*g + e*h)*(1 + m)) - a*b*(2*c*f*h*(1 + m) + d*(f*g + e*h)*(2 + m)))*x\right)/(b^2*(b*c - a*d)^2*(1 + m)*(2 + m)) + (f*h*(a + b*x)^{(3 + m)*((b*(c + d*x))/(b*c - a*d))^m*Hypergeometric2F1[3 + m, 3 + m, 4 + m, -((d*(a + b*x))/(b*c - a*d))])/(b*c - a*d)^3*(3 + m)*(c + d*x)^m$

Rubi [A] time = 0.159763, antiderivative size = 246, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.103$, Rules used = {145, 70, 69}

$$\frac{fh(a + bx)^{m+3}(c + dx)^{-m} \left(\frac{b(c+dx)}{bc-ad}\right)^m {}_2F_1\left(m + 3, m + 3; m + 4; -\frac{d(a+bx)}{bc-ad}\right)}{(m + 3)(bc - ad)^3} - \frac{(a + bx)^{m+1}(c + dx)^{-m-2} (-bx (a^2dfh(2m + 3))}{(m + 3)(bc - ad)^3}$$

Antiderivative was successfully verified.

[In] Int[(a + b*x)^m*(c + d*x)^(-3 - m)*(e + f*x)*(g + h*x), x]

[Out] $-\left(\left((a + b*x)^{(1 + m)}*(c + d*x)^{(-2 - m)}*(a^2*b*c*f*h*m - a^3*d*f*h*(1 + m) - b^3*c*e*g*(2 + m) + a*b^2*(c*(f*g + e*h) + d*e*g*(1 + m)) - b*(a^2*d*f*h*(3 + 2*m) + b^2*(d*e*g + c*(f*g + e*h)*(1 + m)) - a*b*(2*c*f*h*(1 + m) + d*(f*g + e*h)*(2 + m)))*x\right)/(b^2*(b*c - a*d)^2*(1 + m)*(2 + m)) + (f*h*(a + b*x)^{(3 + m)*((b*(c + d*x))/(b*c - a*d))^m*Hypergeometric2F1[3 + m, 3 + m, 4 + m, -((d*(a + b*x))/(b*c - a*d))])/(b*c - a*d)^3*(3 + m)*(c + d*x)^m$

Rule 145

Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_)*((e_.) + (f_.)*(x_))*((g_.) + (h_.)*(x_)), x_Symbol] :> Simp[((b^3*c*e*g*(m + 2) - a^3*d*f*h*(n + 2) - a^2*b*(c*f*h*m - d*(f*g + e*h)*(m + n + 3)) - a*b^2*(c*(f*g + e*h) + d*e*g*(2*m + n + 4)) + b*(a^2*d*f*h*(m - n) - a*b*(2*c*f*h*(m + 1) - d*(f*g + e*h)*(n + 1)) + b^2*(c*(f*g + e*h)*(m + 1) - d*e*g*(m + n + 2)))*x)/(a + b*x)^(m + 1)*(c + d*x)^(n + 1))/(b^2*(b*c - a*d)^2*(m + 1)*(m + 2)), x]

```

+ Dist[(f*h)/b^2 - (d*(m + n + 3)*(a^2*d*f*h*(m - n) - a*b*(2*c*f*h*(m + 1)
) - d*(f*g + e*h)*(n + 1)) + b^2*(c*(f*g + e*h)*(m + 1) - d*e*g*(m + n + 2)
)))/(b^2*(b*c - a*d)^2*(m + 1)*(m + 2)), Int[(a + b*x)^(m + 2)*(c + d*x)^n,
x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n}, x] && (LtQ[m, -2] || (EqQ[
m + n + 3, 0] && !LtQ[n, -2]))

```

Rule 70

```

Int[((a_) + (b_)*(x_))^(m_)*((c_) + (d_)*(x_))^(n_), x_Symbol] := Dist[(c
+ d*x)^FracPart[n]/((b/(b*c - a*d))^IntPart[n]*((b*(c + d*x))/(b*c - a*d)
^FracPart[n]), Int[(a + b*x)^m*Simp[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)
, x]^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && !In
tegerQ[m] && !IntegerQ[n] && (RationalQ[m] || !SimplerQ[n + 1, m + 1])

```

Rule 69

```

Int[((a_) + (b_)*(x_))^(m_)*((c_) + (d_)*(x_))^(n_), x_Symbol] := Simp[(((
a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a + b*x))/(b*c -
a*d))]/(b*(m + 1)*(b/(b*c - a*d))^n), x] /; FreeQ[{a, b, c, d, m, n}, x]
&& NeQ[b*c - a*d, 0] && !IntegerQ[m] && !IntegerQ[n] && GtQ[b/(b*c - a*d)
, 0] && (RationalQ[m] || !(RationalQ[n] && GtQ[-(d/(b*c - a*d)), 0]))

```

Rubi steps

$$\begin{aligned}
\int (a + bx)^m (c + dx)^{-3-m} (e + fx)(g + hx) dx &= -\frac{(a + bx)^{1+m} (c + dx)^{-2-m} (a^2 b c f h m - a^3 d f h (1 + m) - b^3 c e g (2 + m) + a^2 b c e g (2 + m) + a^3 d f h (1 + m) - b^3 c e g (2 + m) + a^2 b c f h m)}{(a + bx)^{1+m} (c + dx)^{-2-m} (a^2 b c f h m - a^3 d f h (1 + m) - b^3 c e g (2 + m) + a^2 b c e g (2 + m) + a^3 d f h (1 + m) - b^3 c e g (2 + m) + a^2 b c f h m)} \\
&= -\frac{(a + bx)^{1+m} (c + dx)^{-2-m} (a^2 b c f h m - a^3 d f h (1 + m) - b^3 c e g (2 + m) + a^2 b c e g (2 + m) + a^3 d f h (1 + m) - b^3 c e g (2 + m) + a^2 b c f h m)}{(a + bx)^{1+m} (c + dx)^{-2-m} (a^2 b c f h m - a^3 d f h (1 + m) - b^3 c e g (2 + m) + a^2 b c e g (2 + m) + a^3 d f h (1 + m) - b^3 c e g (2 + m) + a^2 b c f h m)}
\end{aligned}$$

Mathematica [A] time = 0.331029, size = 237, normalized size = 0.96

$$\frac{(a + bx)^m (c + dx)^{-m-2} \left(d^3 (a + bx) (a^2 b f h (c m - d (2 m + 3) x) + a^3 (-d) f h (m + 1) + a b^2 (c e h + c f (g + 2 h (m + 1) x) + d e g) \right)}{d^3 (a + bx) (a^2 b f h (c m - d (2 m + 3) x) + a^3 (-d) f h (m + 1) + a b^2 (c e h + c f (g + 2 h (m + 1) x) + d e g)}$$

Antiderivative was successfully verified.

[In] Integrate[(a + b*x)^m*(c + d*x)^(-3 - m)*(e + f*x)*(g + h*x), x]

[Out] -(((a + b*x)^m*(c + d*x)^(-2 - m)*(d^3*(a + b*x)*(-(a^3*d*f*h*(1 + m)) + a^2*b*f*h*(c*m - d*(3 + 2*m)*x) + a*b^2*(c*e*h + d*e*g*(1 + m) + d*f*g*(2 + m)*x + d*e*h*(2 + m)*x + c*f*(g + 2*h*(1 + m)*x)) - b^3*(d*e*g*x + c*(e*g*(2 + m) + f*g*(1 + m)*x + e*h*(1 + m)*x))) + ((b*c - a*d)^4*f*h*(1 + m)*Hypergeometric2F1[-2 - m, -2 - m, -1 - m, (b*(c + d*x))/(b*c - a*d)])/((d*(a + b*x))/(-b*c + a*d))^m)/(b^2*d^3*(b*c - a*d)^2*(1 + m)*(2 + m))

Maple [F] time = 0.052, size = 0, normalized size = 0.

$$\int (bx + a)^m (dx + c)^{-3-m} (fx + e)(hx + g) dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b*x+a)^m*(d*x+c)^(-3-m)*(f*x+e)*(h*x+g), x)

[Out] int((b*x+a)^m*(d*x+c)^(-3-m)*(f*x+e)*(h*x+g), x)

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (fx + e)(hx + g)(bx + a)^m(dx + c)^{-m-3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b*x+a)^m*(d*x+c)^(-3-m)*(f*x+e)*(h*x+g), x, algorithm="maxima")

[Out] integrate((f*x + e)*(h*x + g)*(b*x + a)^m*(d*x + c)^(-m - 3), x)

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}((f h x^2 + e g + (f g + e h) x)(b x + a)^m (d x + c)^{-m-3}, x)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b*x+a)^m*(d*x+c)^(-3-m)*(f*x+e)*(h*x+g), x, algorithm="fricas")

[Out] `integral((f*h*x^2 + e*g + (f*g + e*h)*x)*(b*x + a)^m*(d*x + c)^(-m - 3), x)`

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((b*x+a)**m*(d*x+c)**(-3-m)*(f*x+e)*(h*x+g), x)`

[Out] Timed out

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (fx + e)(hx + g)(bx + a)^m(dx + c)^{-m-3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((b*x+a)^m*(d*x+c)^(-3-m)*(f*x+e)*(h*x+g), x, algorithm="giac")`

[Out] `integrate((f*x + e)*(h*x + g)*(b*x + a)^m*(d*x + c)^(-m - 3), x)`

3.130 $\int (a + bx)^m (c + dx)^{-4-m} (e + fx)(g + hx) dx$

Optimal. Leaf size=362

$$\frac{(a + bx)^{m+1}(c + dx)^{-m-2} \left(a^2 d^2 fh (m^2 + 5m + 6) - abd(m + 3)(2c fh(m + 1) + d(eh + fg)) + b^2 (c^2 fh (m^2 + 3m + 2) + cd^2) \right)}{bd^2(m + 2)(m + 3)(bc - ad)^2}$$

[Out] $((a^2 d^2 f h (6 + 5 m + m^2) - a b d (3 + m) (d (f g + e h) + 2 c f h (1 + m)) + b^2 (2 d^2 e g + c d (f g + e h) (1 + m) + c^2 f h (2 + 3 m + m^2))) * (a + b x)^{(1 + m)} (c + d x)^{(-2 - m)}) / (b d^2 (b c - a d)^2 (2 + m) (3 + m)) + ((a^2 d^2 f h (6 + 5 m + m^2) - a b d (3 + m) (d (f g + e h) + 2 c f h (1 + m)) + b^2 (2 d^2 e g + c d (f g + e h) (1 + m) + c^2 f h (2 + 3 m + m^2))) * (a + b x)^{(1 + m)} (c + d x)^{(-1 - m)}) / (d^2 (b c - a d)^3 (1 + m) (2 + m) (3 + m)) + ((a + b x)^{(1 + m)} (c + d x)^{(-3 - m)} (a c d f h (3 + m) + b (d^2 e g - c d (f g + e h) - c^2 f h (2 + m)) - d (b c - a d) f h (3 + m) x)) / (b d^2 (b c - a d) (3 + m))$

Rubi [A] time = 0.361866, antiderivative size = 362, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.103$, Rules used = {146, 45, 37}

$$\frac{(a + bx)^{m+1}(c + dx)^{-m-2} \left(a^2 d^2 fh (m^2 + 5m + 6) - abd(m + 3)(2c fh(m + 1) + d(eh + fg)) + b^2 (c^2 fh (m^2 + 3m + 2) + cd^2) \right)}{bd^2(m + 2)(m + 3)(bc - ad)^2}$$

Antiderivative was successfully verified.

[In] Int[(a + b*x)^m*(c + d*x)^(-4 - m)*(e + f*x)*(g + h*x), x]

[Out] $((a^2 d^2 f h (6 + 5 m + m^2) - a b d (3 + m) (d (f g + e h) + 2 c f h (1 + m)) + b^2 (2 d^2 e g + c d (f g + e h) (1 + m) + c^2 f h (2 + 3 m + m^2))) * (a + b x)^{(1 + m)} (c + d x)^{(-2 - m)}) / (b d^2 (b c - a d)^2 (2 + m) (3 + m)) + ((a^2 d^2 f h (6 + 5 m + m^2) - a b d (3 + m) (d (f g + e h) + 2 c f h (1 + m)) + b^2 (2 d^2 e g + c d (f g + e h) (1 + m) + c^2 f h (2 + 3 m + m^2))) * (a + b x)^{(1 + m)} (c + d x)^{(-1 - m)}) / (d^2 (b c - a d)^3 (1 + m) (2 + m) (3 + m)) + ((a + b x)^{(1 + m)} (c + d x)^{(-3 - m)} (a c d f h (3 + m) + b (d^2 e g - c d (f g + e h) - c^2 f h (2 + m)) - d (b c - a d) f h (3 + m) x)) / (b d^2 (b c - a d) (3 + m))$

Rule 146

Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))*((g_.) + (h_.)*(x_)), x_Symbol] := Simp[(a^2*d*f*h*(n + 2) + b^2*d*e*g*(

Antiderivative was successfully verified.

[In] Integrate[(a + b*x)^m*(c + d*x)^(-4 - m)*(e + f*x)*(g + h*x),x]

[Out] ((a + b*x)^(1 + m)*(c + d*x)^(-3 - m)*(a*d*f*h*(3 + m)*(c + d*x) + ((a^2*d^2*f*h*(6 + 5*m + m^2) - a*b*d*(3 + m)*(d*(f*g + e*h) + 2*c*f*h*(1 + m)) + b^2*(2*d^2*e*g + c*d*(f*g + e*h)*(1 + m) + c^2*f*h*(2 + 3*m + m^2)))*(c + d*x)*(-(a*d*(1 + m) + b*c*(2 + m) + b*d*x))/((b*c - a*d)^2*(1 + m)*(2 + m) + b*(d^2*e*g - c^2*f*h*(2 + m) - c*d*(e*h + f*(g + h*(3 + m)*x)))))/(b*d^2*(b*c - a*d)*(3 + m))

Maple [B] time = 0.008, size = 894, normalized size = 2.5

$$(bx + a)^{1+m} (dx + c)^{-3-m} (a^2 d^2 f h m^2 x^2 - 2 a b c d f h m^2 x^2 + b^2 c^2 f h m^2 x^2 + a^2 d^2 e h m^2 x + a^2 d^2 f g m^2 x + 5 a^2 d^2 f h m x^2 - 2 a$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b*x+a)^m*(d*x+c)^(-4-m)*(f*x+e)*(h*x+g),x)

[Out] -(b*x+a)^(1+m)*(d*x+c)^(-3-m)*(a^2*d^2*f*h*m^2*x^2-2*a*b*c*d*f*h*m^2*x^2+b^2*c^2*f*h*m^2*x^2+a^2*d^2*e*h*m^2*x+a^2*d^2*f*g*m^2*x+5*a^2*d^2*f*h*m*x^2-2*a*b*c*d*e*h*m^2*x-2*a*b*c*d*f*g*m^2*x-8*a*b*c*d*f*h*m*x^2-a*b*d^2*e*h*m*x^2-2-a*b*d^2*f*g*m*x^2+b^2*c^2*e*h*m^2*x+b^2*c^2*f*g*m^2*x+3*b^2*c^2*f*h*m*x^2+b^2*c*d*e*h*m*x^2+b^2*c*d*f*g*m*x^2+2*a^2*c*d*f*h*m*x+a^2*d^2*e*g*m^2+4*a^2*d^2*e*h*m*x+4*a^2*d^2*f*g*m*x+6*a^2*d^2*f*h*x^2-2*a*b*c^2*f*h*m*x-2*a*b*c*d*e*g*m^2-8*a*b*c*d*e*h*m*x-8*a*b*c*d*f*g*m*x-6*a*b*c*d*f*h*x^2-2*a*b*d^2*e*g*m*x-3*a*b*d^2*e*h*x^2-3*a*b*d^2*f*g*x^2+b^2*c^2*e*g*m^2+4*b^2*c^2*e*h*m*x+4*b^2*c^2*f*g*m*x+2*b^2*c^2*f*h*x^2+2*b^2*c*d*e*g*m*x+b^2*c*d*e*h*x^2+b^2*c*d*f*g*x^2+2*b^2*d^2*e*g*x^2+a^2*c*d*e*h*m+a^2*c*d*f*g*m+6*a^2*c*d*f*h*x+3*a^2*d^2*e*g*m+3*a^2*d^2*e*h*x+3*a^2*d^2*f*g*x-a*b*c^2*e*h*m-a*b*c^2*f*g*m-2*a*b*c^2*f*h*x-8*a*b*c*d*e*g*m-10*a*b*c*d*e*h*x-10*a*b*c*d*f*g*x-2*a*b*d^2*e*g*x+5*b^2*c^2*e*g*m+3*b^2*c^2*e*h*x+3*b^2*c^2*f*g*x+6*b^2*c*d*e*g*x+2*a^2*c^2*f*h+a^2*c*d*e*h+a^2*c*d*f*g+2*a^2*d^2*e*g-3*a*b*c^2*e*h-3*a*b*c^2*f*g-6*a*b*c*d*e*g+6*b^2*c^2*e*g)/(a^3*d^3*m^3-3*a^2*b*c*d^2*m^3+3*a*b^2*c^2*d*m^3-b^3*c^3*m^3+6*a^3*d^3*m^2-18*a^2*b*c*d^2*m^2+18*a*b^2*c^2*d*m^2-6*b^3*c^3*m^2+11*a^3*d^3*m-33*a^2*b*c*d^2*m+33*a*b^2*c^2*d*m-11*b^3*c^3*m+6*a^3*d^3-18*a^2*b*c*d^2+18*a*b^2*c^2*d-6*b^3*c^3)

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (fx + e)(hx + g)(bx + a)^m(dx + c)^{-m-4} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b*x+a)^m*(d*x+c)^(-4-m)*(f*x+e)*(h*x+g),x, algorithm="maxima")

[Out] integrate((f*x + e)*(h*x + g)*(b*x + a)^m*(d*x + c)^(-m - 4), x)

Fricas [B] time = 1.4598, size = 3309, normalized size = 9.14

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b*x+a)^m*(d*x+c)^(-4-m)*(f*x+e)*(h*x+g),x, algorithm="fricas")

[Out] ((a*b^2*c^3 - 2*a^2*b*c^2*d + a^3*c*d^2)*e*g*m^2 + ((b^3*c^2*d - 2*a*b^2*c*d^2 + a^2*b*d^3)*f*h*m^2 + (2*b^3*d^3*e + (b^3*c*d^2 - 3*a*b^2*d^3)*f)*g + ((b^3*c*d^2 - 3*a*b^2*d^3)*e + 2*(b^3*c^2*d - 3*a*b^2*c*d^2 + 3*a^2*b*d^3)*f)*h + ((b^3*c*d^2 - a*b^2*d^3)*f*g + ((b^3*c*d^2 - a*b^2*d^3)*e + (3*b^3*c^2*d - 8*a*b^2*c*d^2 + 5*a^2*b*d^3)*f)*h)*m)*x^4 + (((b^3*c^2*d - 2*a*b^2*c*d^2 + a^2*b*d^3)*f*g + ((b^3*c^2*d - 2*a*b^2*c*d^2 + a^2*b*d^3)*e + (b^3*c^3 - a*b^2*c^2*d - a^2*b*c*d^2 + a^3*d^3)*f)*h)*m^2 + 4*(2*b^3*c*d^2*e + (b^3*c^2*d - 3*a*b^2*c*d^2)*f)*g + 2*(2*(b^3*c^2*d - 3*a*b^2*c*d^2)*e + (b^3*c^3 - 3*a*b^2*c^2*d + 3*a^2*b*c*d^2 + 3*a^3*d^3)*f)*h + ((2*(b^3*c*d^2 - a*b^2*d^3)*e + (5*b^3*c^2*d - 8*a*b^2*c*d^2 + 3*a^2*b*d^3)*f)*g + ((5*b^3*c^2*d - 8*a*b^2*c*d^2 + 3*a^2*b*d^3)*e + (3*b^3*c^3 - 7*a*b^2*c^2*d - a^2*b*c*d^2 + 5*a^3*d^3)*f)*h)*m)*x^3 + (((b^3*c^2*d - 2*a*b^2*c*d^2 + a^2*b*d^3)*e + (b^3*c^3 - a*b^2*c^2*d - a^2*b*c*d^2 + a^3*d^3)*f)*g + ((b^3*c^3 - a*b^2*c^2*d - a^2*b*c*d^2 + a^3*d^3)*e + (a*b^2*c^3 - 2*a^2*b*c^2*d + a^3*c*d^2)*f)*h)*m^2 + 3*(4*b^3*c^2*d*e + (b^3*c^3 - 3*a*b^2*c^2*d - 3*a^2*b*c*d^2 + a^3*d^3)*f)*g + 3*(4*a^3*c*d^2*f + (b^3*c^3 - 3*a*b^2*c^2*d - 3*a^2*b*c*d^2 + a^3*d^3)*e)*h + (((7*b^3*c^2*d - 8*a*b^2*c*d^2 + a^2*b*d^3)*e + 4*(b^3*c^3 - a*b^2*c^2*d - a^2*b*c*d^2 + a^3*d^3)*f)*g + (4*(b^3*c^3 - a*b^2*c^2*d - a^2*b*c*d^2 + a^3*d^3)*e + (a*b^2*c^3 - 8*a^2*b*c^2*d + 7*a^3*c*d^2)*f)*h)*m)*x^2 + (2*(3*a*b^2*c^3 - 3*a^2*b*c^2*d + a^3*c*d^2)*e - (3*a^2*b*c^3 - a^3*c^2*d)*f)*g + (2*a^3*c^3*f - (3*a^2*b*c^3 - a^3*c^2*d)*e)*h - ((a^2*b*c^3 - a^3*c^2*d)*e*h - ((5*a*b^2*c^3 - 8*a^2*b*c^2*d + 3*a^3*c*d^2)*e - (a^2*b*c^3 - a^3*c^2*d)*f)*g)*m + (((a*b^2*c^3 - 2*a^2*b*c^2*d + a^3*c*d^2)*e*

$$h + ((b^3c^3 - ab^2c^2d - a^2b^2cd^2 + a^3d^3)e + (ab^2c^3 - 2a^2b^2c^2d + a^3c^2d^2)f)g)m^2 + 2*((3b^3c^3 + 3ab^2c^2d - 3a^2b^2cd^2 + a^3d^3)e - 2*(3a^2b^2c^2d - a^3c^2d^2)f)g + 4*(2a^3c^2d^2f - (3a^2b^2c^2d - a^3c^2d^2)e)h + (((5b^3c^3 - ab^2c^2d - 7a^2b^2cd^2 + 3a^3d^3)e + (3ab^2c^3 - 8a^2b^2c^2d + 5a^3c^2d^2)f)g + ((3ab^2c^3 - 8a^2b^2c^2d + 5a^3c^2d^2)e - 2*(a^2b^2c^3 - a^3c^2d^2)f)h)m)x)(bx + a)^m(dx + c)^{-m-4}/(6b^3c^3 - 18ab^2c^2d + 18a^2b^2cd^2 - 6a^3d^3 + (b^3c^3 - 3ab^2c^2d + 3a^2b^2cd^2 - a^3d^3)m^3 + 6*(b^3c^3 - 3ab^2c^2d + 3a^2b^2cd^2 - a^3d^3)m^2 + 11*(b^3c^3 - 3ab^2c^2d + 3a^2b^2cd^2 - a^3d^3)m)$$

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b*x+a)**m*(d*x+c)**(-4-m)*(f*x+e)*(h*x+g),x)

[Out] Timed out

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (fx + e)(hx + g)(bx + a)^m(dx + c)^{-m-4} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b*x+a)^m*(d*x+c)^(-4-m)*(f*x+e)*(h*x+g),x, algorithm="giac")

[Out] integrate((f*x + e)*(h*x + g)*(b*x + a)^m*(d*x + c)^(-m - 4), x)

3.131 $\int (a + bx)^m (c + dx)^{-5-m} (e + fx)(g + hx) dx$

Optimal. Leaf size=507

$$\frac{(a + bx)^{m+1}(c + dx)^{-m-3} \left(a^2 d^2 f h (m^2 + 7m + 12) - 2abd(m + 4)(cfh(m + 1) + d(eh + fg)) + b^2 (c^2 f h (m^2 + 3m + 2) + \dots \right)}{2bd^2(m + 3)(m + 4)(bc - ad)^2}$$

```
[Out] ((a^2*d^2*f*h*(12 + 7*m + m^2) - 2*a*b*d*(4 + m)*(d*(f*g + e*h) + c*f*h*(1 + m)) + b^2*(6*d^2*e*g + 2*c*d*(f*g + e*h)*(1 + m) + c^2*f*h*(2 + 3*m + m^2))) * (a + b*x)^(1 + m) * (c + d*x)^(-3 - m)) / (2*b*d^2*(b*c - a*d)^2*(3 + m)*(4 + m)) + ((a^2*d^2*f*h*(12 + 7*m + m^2) - 2*a*b*d*(4 + m)*(d*(f*g + e*h) + c*f*h*(1 + m)) + b^2*(6*d^2*e*g + 2*c*d*(f*g + e*h)*(1 + m) + c^2*f*h*(2 + 3*m + m^2))) * (a + b*x)^(1 + m) * (c + d*x)^(-2 - m)) / (d^2*(b*c - a*d)^3*(2 + m)*(3 + m)*(4 + m)) + (b*(a^2*d^2*f*h*(12 + 7*m + m^2) - 2*a*b*d*(4 + m)*(d*(f*g + e*h) + c*f*h*(1 + m)) + b^2*(6*d^2*e*g + 2*c*d*(f*g + e*h)*(1 + m) + c^2*f*h*(2 + 3*m + m^2))) * (a + b*x)^(1 + m) * (c + d*x)^(-1 - m)) / (d^2*(b*c - a*d)^4*(1 + m)*(2 + m)*(3 + m)*(4 + m)) + ((a + b*x)^(1 + m) * (c + d*x)^(-4 - m) * (a*c*d*f*h*(4 + m) + b*(2*d^2*e*g - 2*c*d*(f*g + e*h) - c^2*f*h*(2 + m)) - d*(b*c - a*d)*f*h*(4 + m)*x)) / (2*b*d^2*(b*c - a*d)*(4 + m))
```

Rubi [A] time = 0.585929, antiderivative size = 507, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.103$, Rules used = {146, 45, 37}

$$\frac{(a + bx)^{m+1}(c + dx)^{-m-3} \left(a^2 d^2 f h (m^2 + 7m + 12) - 2abd(m + 4)(cfh(m + 1) + d(eh + fg)) + b^2 (c^2 f h (m^2 + 3m + 2) + \dots \right)}{2bd^2(m + 3)(m + 4)(bc - ad)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x)^m*(c + d*x)^(-5 - m)*(e + f*x)*(g + h*x), x]
```

```
[Out] ((a^2*d^2*f*h*(12 + 7*m + m^2) - 2*a*b*d*(4 + m)*(d*(f*g + e*h) + c*f*h*(1 + m)) + b^2*(6*d^2*e*g + 2*c*d*(f*g + e*h)*(1 + m) + c^2*f*h*(2 + 3*m + m^2))) * (a + b*x)^(1 + m) * (c + d*x)^(-3 - m)) / (2*b*d^2*(b*c - a*d)^2*(3 + m)*(4 + m)) + ((a^2*d^2*f*h*(12 + 7*m + m^2) - 2*a*b*d*(4 + m)*(d*(f*g + e*h) + c*f*h*(1 + m)) + b^2*(6*d^2*e*g + 2*c*d*(f*g + e*h)*(1 + m) + c^2*f*h*(2 + 3*m + m^2))) * (a + b*x)^(1 + m) * (c + d*x)^(-2 - m)) / (d^2*(b*c - a*d)^3*(2 + m)*(3 + m)*(4 + m)) + (b*(a^2*d^2*f*h*(12 + 7*m + m^2) - 2*a*b*d*(4 + m)*(d*(f*g + e*h) + c*f*h*(1 + m)) + b^2*(6*d^2*e*g + 2*c*d*(f*g + e*h)*(1 + m) + c^2*f*h*(2 + 3*m + m^2))) * (a + b*x)^(1 + m) * (c + d*x)^(-1 - m)) / (d^2*(b*c - a*d)^4*(1 + m)*(2 + m)*(3 + m)*(4 + m)) + ((a + b*x)^(1 + m) * (c + d*x)^(-4 - m) * (a*c*d*f*h*(4 + m) + b*(2*d^2*e*g - 2*c*d*(f*g + e*h) - c^2*f*h*(2 + m)) - d*(b*c - a*d)*f*h*(4 + m)*x)) / (2*b*d^2*(b*c - a*d)*(4 + m))
```

+ m)) - d*(b*c - a*d)*f*h*(4 + m)*x)/(2*b*d^2*(b*c - a*d)*(4 + m))

Rule 146

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))
*((g_.) + (h_.)*(x_)), x_Symbol] := Simp[((a^2*d*f*h*(n + 2) + b^2*d*e*g*(
m + n + 3) + a*b*(c*f*h*(m + 1) - d*(f*g + e*h)*(m + n + 3)) + b*f*h*(b*c -
a*d)*(m + 1)*x*(a + b*x)^(m + 1)*(c + d*x)^(n + 1))/(b^2*d*(b*c - a*d)*(m
+ 1)*(m + n + 3)), x] - Dist[(a^2*d^2*f*h*(n + 1)*(n + 2) + a*b*d*(n + 1)*
(2*c*f*h*(m + 1) - d*(f*g + e*h)*(m + n + 3)) + b^2*(c^2*f*h*(m + 1)*(m + 2)
- c*d*(f*g + e*h)*(m + 1)*(m + n + 3) + d^2*e*g*(m + n + 2)*(m + n + 3))
/(b^2*d*(b*c - a*d)*(m + 1)*(m + n + 3)), Int[(a + b*x)^(m + 1)*(c + d*x)^n
, x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n}, x] && ((GeQ[m, -2] && LtQ
[m, -1]) || SumSimplerQ[m, 1]) && NeQ[m, -1] && NeQ[m + n + 3, 0]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*S
implify[m + n + 2])/((b*c - a*d)*(m + 1)), Int[(a + b*x)^Simplify[m + 1]*(c
+ d*x)^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && I
LtQ[Simplify[m + n + 2], 0] && NeQ[m, -1] && !(LtQ[m, -1] && LtQ[n, -1] &&
(EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && (SumSimpler
Q[m, 1] || !SumSimplerQ[n, 1])
```

Rule 37

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := Simp
[((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] /; FreeQ[{
a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && EqQ[m + n + 2, 0] && NeQ[m, -
1]
```

Rubi steps

$$\int (a + bx)^m (c + dx)^{-5-m} (e + fx)(g + hx) dx = \frac{(a + bx)^{1+m} (c + dx)^{-4-m} (acd fh(4 + m) + b(2d^2 eg - 2cd(fg + eh) - c^2 f))}{2bd^2(bc - ad)(4 + m)}$$

$$= \frac{(a^2 d^2 fh(12 + 7m + m^2) - 2abd(4 + m)(d(fg + eh) + cfh(1 + m)) + b^2 (6d^2 eg + 2cd(fg + eh) + c^2 f))}{2bd^2(bc - ad)}$$

$$= \frac{(a^2 d^2 fh(12 + 7m + m^2) - 2abd(4 + m)(d(fg + eh) + cfh(1 + m)) + b^2 (6d^2 eg + 2cd(fg + eh) + c^2 f))}{2bd^2(bc - ad)}$$

$$= \frac{(a^2 d^2 fh(12 + 7m + m^2) - 2abd(4 + m)(d(fg + eh) + cfh(1 + m)) + b^2 (6d^2 eg + 2cd(fg + eh) + c^2 f))}{2bd^2(bc - ad)}$$

Mathematica [A] time = 0.76909, size = 279, normalized size = 0.55

$$(a + bx)^{m+1} (c + dx)^{-m-4} \left(\frac{(c+dx)(a^2 d^2 (m^2+3m+2) - 2abd(m+1)(c(m+3)+dx) + b^2 (m^2+5m+6) + 2cd(m+3)x + 2d^2 x^2)}{(m+1)(m+2)(m+3)(bc-ad)^3} (a^2 d^2 fh(m^2+7m+12) - 2abd(m+1)(d(fg+eh) + cfh(1+m)) + b^2 (6d^2 eg + 2cd(fg+eh) + c^2 f)) \right)$$

Antiderivative was successfully verified.

[In] Integrate[(a + b*x)^m*(c + d*x)^(-5 - m)*(e + f*x)*(g + h*x), x]

[Out] ((a + b*x)^(1 + m)*(c + d*x)^(-4 - m)*(a*d*f*h*(4 + m)*(c + d*x) + b*(2*d^2*e*g - c^2*f*h*(2 + m) - c*d*(2*f*g + 2*e*h + f*h*(4 + m)*x)) + ((a^2*d^2*f*h*(12 + 7*m + m^2) - 2*a*b*d*(4 + m)*(d*(f*g + e*h) + c*f*h*(1 + m)) + b^2*(6*d^2*e*g + 2*c*d*(f*g + e*h)*(1 + m) + c^2*f*h*(2 + 3*m + m^2)))*(c + d*x)*(a^2*d^2*(2 + 3*m + m^2) - 2*a*b*d*(1 + m)*(c*(3 + m) + d*x) + b^2*(c^2*(6 + 5*m + m^2) + 2*c*d*(3 + m)*x + 2*d^2*x^2)))/((b*c - a*d)^3*(1 + m)*(2 + m)*(3 + m)))/(2*b*d^2*(b*c - a*d)*(4 + m))

Maple [B] time = 0.01, size = 2343, normalized size = 4.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b*x+a)^m*(d*x+c)^(-5-m)*(f*x+e)*(h*x+g), x)

[Out] -(b*x+a)^(1+m)*(d*x+c)^(-4-m)*(a^3*d^3*f*h*m^3*x^2-3*a^2*b*c*d^2*f*h*m^3*x^2-2*a^2*b*d^3*f*h*m^2*x^3+3*a*b^2*c^2*d*f*h*m^3*x^2+2*a*b^2*c*d^2*f*h*m^2*x^3)

$$\begin{aligned}
& -b^3c^3f^3hm^3x^2 - b^3c^2d^2f^3hm^2x^3 + a^3d^3e^3hm^3x + a^3d^3f^3g^3m^3x + 8a^3d^3f^3hm^2x^2 - 3a^2b^2c^2d^2e^3hm^3x - 3a^2b^2c^2d^2f^3g^3m^3x - 2 \\
& 3a^2b^2c^2d^2f^3hm^2x^2 - 2a^2b^2d^3e^3hm^2x^2 - 2a^2b^2d^3f^3g^3m^2x^2 - 7a^2b^2d^3f^3hm^2x^3 + 3a^2b^2c^2d^2e^3hm^3x + 3a^2b^2c^2d^2f^3g^3m^3x + 22a^2b \\
& ^2c^2d^2f^3hm^2x^2 + 4a^2b^2c^2d^2e^3hm^2x^2 + 4a^2b^2c^2d^2f^3g^3m^2x^2 + 10a^2b^2c^2d^2f^3hm^2x^3 + 2a^2b^2d^3e^3hm^2x^3 + 2a^2b^2d^3f^3g^3m^2x^3 - b^3c^3e^3 \\
& e^3hm^3x - b^3c^3f^3g^3m^3x - 7b^3c^3f^3hm^2x^2 - 2b^3c^2d^2e^3hm^2x^2 - 2b^3c^2d^2f^3g^3m^2x^2 - 3b^3c^2d^2f^3hm^2x^3 - 2b^3c^2d^2e^3hm^2x^3 - 2b^3c^2d^2f^3g^3m^2x^3 + 2a^3c^2d^2f^3hm^2x^2 + a^3d^3e^3g^3m^3 + 7a^3d^3e^3hm^2x^2 + 7a \\
& ^3d^3f^3g^3m^2x^2 + 19a^3d^3f^3hm^2x^2 - 4a^2b^2c^2d^2f^3hm^2x^2 - 3a^2b^2c^2d^2e^3g^3m^3 - 22a^2b^2c^2d^2e^3hm^2x^2 - 22a^2b^2c^2d^2f^3g^3m^2x^2 - 58a^2b^2c^2d^2f^3 \\
& hm^2x^2 - 3a^2b^2d^3e^3g^3m^2x^2 - 10a^2b^2d^3e^3hm^2x^2 - 10a^2b^2d^3f^3g^3m^2x^2 - 12a^2b^2d^3f^3hm^2x^3 + 2a^2b^2c^3f^3hm^2x^2 + 3a^2b^2c^2d^2e^3g^3m^3 + 23a^2b^2 \\
& c^2d^2e^3hm^2x^2 + 23a^2b^2c^2d^2f^3g^3m^2x^2 + 53a^2b^2c^2d^2f^3hm^2x^2 + 6a^2b^2c^2d^2e^3g^3m^2x^2 + 20a^2b^2c^2d^2e^3hm^2x^2 + 20a^2b^2c^2d^2f^3g^3m^2x^2 + 8a^2b^2c^2d^2e^3 \\
& hm^2x^3 + 6a^2b^2d^3e^3g^3m^2x^2 + 8a^2b^2d^3e^3hm^2x^3 + 8a^2b^2d^3f^3g^3m^2x^3 - b^3c^3e^3g^3m^3 - 8b^3c^3e^3hm^2x^2 - 8b^3c^3f^3g^3m^2x^2 - 14b^3c^3f^3hm^2x^3 - 2b^3c^3d^2e^3g^3m^2x^2 - 10b^3c^2d^2e^3hm^2x^2 - 10b^3c^2d^2f^3g^3m^2x^2 - 2b^3c^2d^2f^3hm^2x^3 - 6b^3c^2d^2e^3g^3m^2x^2 - 2b^3c^2d^2e^3hm^2x^3 - 2b^3c^2d^2f^3g^3m^2x^3 - 6b^3d^3e^3g^3m^2x^3 + a^3c^2d^2e^3hm^2x^2 + a^3c^2d^2f^3g^3m^2x^2 + 10a^3c^2d^2f^3hm^2x^3 + 6a^3d^3e^3g^3m^2x^2 + 14a^3d^3e^3hm^2x^3 + 14a^3d^3f^3g^3m^2x^2 + 12a^3d^3f^3hm^2x^3 - 2a^2b^2c^2d^2e^3hm^2x^2 - 2a^2b^2c^2d^2f^3g^3m^2x^2 - 20a^2b^2c^2d^2f^3hm^2x^3 - 21a^2b^2c^2d^2e^3g^3m^2x^2 - 53a^2b^2c^2d^2e^3hm^2x^3 - 53a^2b^2c^2d^2f^3g^3m^2x^3 - 56a^2b^2c^2d^2f^3hm^2x^3 - 9a^2b^2d^3e^3g^3m^2x^2 - 8a^2b^2d^3e^3hm^2x^3 - 8a^2b^2d^3f^3g^3m^2x^3 + a^2b^2c^3e^3hm^2x^2 + a^2b^2c^3f^3g^3m^2x^2 + 10a^2b^2c^3f^3hm^2x^3 + 24a^2b^2c^2d^2e^3g^3m^2x^2 + 58a^2b^2c^2d^2e^3hm^2x^3 + 58a^2b^2c^2d^2f^3g^3m^2x^3 + 34a^2b^2c^2d^2f^3hm^2x^3 + 30a^2b^2c^2d^2e^3g^3m^2x^3 + 34a^2b^2c^2d^2e^3hm^2x^3 + 34a^2b^2c^2d^2f^3g^3m^2x^3 + 6a^2b^2d^3e^3g^3m^2x^3 - 9b^3c^3e^3g^3m^2x^2 - 19b^3c^3e^3hm^2x^3 - 19b^3c^3f^3g^3m^2x^3 - 8b^3c^3f^3hm^2x^3 - 21b^3c^2d^2e^3g^3m^2x^2 - 8b^3c^2d^2e^3hm^2x^3 - 8b^3c^2d^2f^3g^3m^2x^3 - 24b^3c^2d^2e^3g^3m^2x^3 + 2a^3c^2d^2f^3hm^2x^3 + 3a^3c^2d^2e^3hm^2x^3 + 3a^3c^2d^2f^3g^3m^2x^3 + 8a^3c^2d^2f^3hm^2x^3 + 11a^3d^3e^3g^3m^2x^3 + 8a^3d^3e^3hm^2x^3 + 8a^3d^3f^3g^3m^2x^3 - 2a^2b^2c^3f^3hm^2x^3 - 10a^2b^2c^2d^2e^3hm^2x^3 - 10a^2b^2c^2d^2f^3g^3m^2x^3 - 34a^2b^2c^2d^2f^3hm^2x^3 - 42a^2b^2c^2d^2e^3g^3m^2x^3 - 34a^2b^2c^2d^2e^3hm^2x^3 - 34a^2b^2c^2d^2f^3g^3m^2x^3 - 6a^2b^2d^3e^3g^3m^2x^3 + 7a^2b^2c^3e^3hm^2x^3 + 7a^2b^2c^3f^3g^3m^2x^3 + 8a^2b^2c^3f^3hm^2x^3 + 57a^2b^2c^2d^2e^3g^3m^2x^3 + 56a^2b^2c^2d^2e^3hm^2x^3 + 56a^2b^2c^2d^2f^3g^3m^2x^3 + 24a^2b^2c^2d^2e^3g^3m^2x^3 - 26b^3c^3e^3g^3m^2x^3 - 12b^3c^3e^3hm^2x^3 - 12b^3c^3f^3g^3m^2x^3 - 36b^3c^2d^2e^3g^3m^2x^3 + 2a^3c^2d^2f^3hm^2x^3 + 3c^2d^2e^3hm^2x^3 + 2a^3c^2d^2f^3g^3m^2x^3 + 6a^3d^3e^3g^3m^2x^3 - 8a^2b^2c^3f^3hm^2x^3 - 8a^2b^2c^2d^2e^3hm^2x^3 - 8a^2b^2c^2d^2f^3g^3m^2x^3 - 24a^2b^2c^2d^2e^3g^3m^2x^3 + 12a^2b^2c^3e^3hm^2x^3 + 12a^2b^2c^3f^3g^3m^2x^3 + 36a^2b^2c^2d^2e^3g^3m^2x^3 - 24b^3c^3e^3g^3m^2x^3) / (a^4d^4m^4 - 4a^3b^2c^2d^3m^4 + 6a^2b^2c^2d^2m^4 - 4a^2b^3c^3d^3m^4 + b^4c^4m^4 + 10a^4d^4m^3 - 40a^3b^2c^2d^3m^3 + 60a^2b^2c^2d^2m^3 - 40a^2b^3c^3d^3m^3 + 10b^4c^4m^3 + 35a^4d^4m^2 - 140a^3b^2c^2d^3m^2 + 210a^2b^2c^2d^2m^2 - 140a^2b^3c^3d^3m^2 + 35b^4c^4m^2 + 50a^4d^4m - 200a^3b^2c^2d^3m + 300a^2b^2c^2d^2m - 200a^2b^3c^3d^3m + 50b^4c^4m + 24a^4d^4 - 96a^3b^2c^2d^3 + 144a^2b^2c^2d^2 - 96a^2b^3c^3d^3 + 24b^4c^4)
\end{aligned}$$

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (fx + e)(hx + g)(bx + a)^m(dx + c)^{-m-5} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b*x+a)^m*(d*x+c)^(-5-m)*(f*x+e)*(h*x+g),x, algorithm="maxima")

[Out] integrate((f*x + e)*(h*x + g)*(b*x + a)^m*(d*x + c)^(-m - 5), x)

Fricas [B] time = 1.97079, size = 6969, normalized size = 13.75

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b*x+a)^m*(d*x+c)^(-5-m)*(f*x+e)*(h*x+g),x, algorithm="fricas")

[Out] ((a*b^3*c^4 - 3*a^2*b^2*c^3*d + 3*a^3*b*c^2*d^2 - a^4*c*d^3)*e*g*m^3 + ((b^4*c^2*d^2 - 2*a*b^3*c*d^3 + a^2*b^2*d^4)*f*h*m^2 + 2*(3*b^4*d^4*e + (b^4*c*d^3 - 4*a*b^3*d^4)*f)*g + 2*((b^4*c*d^3 - 4*a*b^3*d^4)*e + (b^4*c^2*d^2 - 4*a*b^3*c*d^3 + 6*a^2*b^2*d^4)*f)*h + (2*(b^4*c*d^3 - a*b^3*d^4)*f*g + (2*(b^4*c*d^3 - a*b^3*d^4)*e + (3*b^4*c^2*d^2 - 10*a*b^3*c*d^3 + 7*a^2*b^2*d^4)*f)*h)*m)*x^5 + ((b^4*c^3*d - 3*a*b^3*c^2*d^2 + 3*a^2*b^2*c*d^3 - a^3*b*d^4)*f*h*m^3 + (2*(b^4*c^2*d^2 - 2*a*b^3*c*d^3 + a^2*b^2*d^4)*f*g + (2*(b^4*c^2*d^2 - 2*a*b^3*c*d^3 + a^2*b^2*d^4)*e + (8*b^4*c^3*d - 23*a*b^3*c^2*d^2 + 2*2*a^2*b^2*c*d^3 - 7*a^3*b*d^4)*f)*h)*m^2 + 10*(3*b^4*c*d^3*e + (b^4*c^2*d^2 - 4*a*b^3*c*d^3)*f)*g + 10*((b^4*c^2*d^2 - 4*a*b^3*c*d^3)*e + (b^4*c^3*d - 4*a*b^3*c^2*d^2 + 6*a^2*b^2*c*d^3)*f)*h + (2*(3*(b^4*c*d^3 - a*b^3*d^4)*e + 2*(3*b^4*c^2*d^2 - 5*a*b^3*c*d^3 + 2*a^2*b^2*d^4)*f)*g + (4*(3*b^4*c^2*d^2 - 5*a*b^3*c*d^3 + 2*a^2*b^2*d^4)*e + (17*b^4*c^3*d - 60*a*b^3*c^2*d^2 + 5*5*a^2*b^2*c*d^3 - 12*a^3*b*d^4)*f)*h)*m)*x^4 + (((b^4*c^3*d - 3*a*b^3*c^2*d^2 + 3*a^2*b^2*c*d^3 - a^3*b*d^4)*f*g + ((b^4*c^3*d - 3*a*b^3*c^2*d^2 + 3*a^2*b^2*c*d^3 - a^3*b*d^4)*e + (b^4*c^4 - 2*a*b^3*c^3*d + 2*a^3*b*c*d^3 - a^4*d^4)*f)*h)*m^3 + ((3*(b^4*c^2*d^2 - 2*a*b^3*c*d^3 + a^2*b^2*d^4)*e + 5*(2*b^4*c^3*d - 5*a*b^3*c^2*d^2 + 4*a^2*b^2*c*d^3 - a^3*b*d^4)*f)*g + (5*(2*b^4*c^3*d - 5*a*b^3*c^2*d^2 + 4*a^2*b^2*c*d^3 - a^3*b*d^4)*e + (7*b^4*c^4 - 1*6*a*b^3*c^3*d + 3*a^2*b^2*c^2*d^2 + 14*a^3*b*c*d^3 - 8*a^4*d^4)*f)*h)*m^2 +

$$\begin{aligned}
& 20*(3*b^4*c^2*d^2*e + (b^4*c^3*d - 4*a*b^3*c^2*d^2)*f)*g + 4*(5*(b^4*c^3*d \\
& - 4*a*b^3*c^2*d^2)*e + (2*b^4*c^4 - 8*a*b^3*c^3*d + 12*a^2*b^2*c^2*d^2 + 1 \\
& 2*a^3*b*c*d^3 - 3*a^4*d^4)*f)*h + ((3*(9*b^4*c^2*d^2 - 10*a*b^3*c*d^3 + a^2 \\
& *b^2*d^4)*e + (29*b^4*c^3*d - 66*a*b^3*c^2*d^2 + 41*a^2*b^2*c*d^3 - 4*a^3*b \\
& *d^4)*f)*g + ((29*b^4*c^3*d - 66*a*b^3*c^2*d^2 + 41*a^2*b^2*c*d^3 - 4*a^3*b \\
& *d^4)*e + (14*b^4*c^4 - 46*a*b^3*c^3*d + 15*a^2*b^2*c^2*d^2 + 36*a^3*b*c*d^ \\
& 3 - 19*a^4*d^4)*f)*h)*m)*x^3 - ((a^2*b^2*c^4 - 2*a^3*b*c^3*d + a^4*c^2*d^2) \\
& *e*h - (3*(3*a*b^3*c^4 - 8*a^2*b^2*c^3*d + 7*a^3*b*c^2*d^2 - 2*a^4*c*d^3)*e \\
& - (a^2*b^2*c^4 - 2*a^3*b*c^3*d + a^4*c^2*d^2)*f)*g)*m^2 + (((b^4*c^3*d - \\
& 3*a*b^3*c^2*d^2 + 3*a^2*b^2*c*d^3 - a^3*b*d^4)*e + (b^4*c^4 - 2*a*b^3*c^3*d \\
& + 2*a^3*b*c*d^3 - a^4*d^4)*f)*g + ((b^4*c^4 - 2*a*b^3*c^3*d + 2*a^3*b*c*d^ \\
& 3 - a^4*d^4)*e + (a*b^3*c^4 - 3*a^2*b^2*c^3*d + 3*a^3*b*c^2*d^2 - a^4*c*d^3 \\
&)*f)*h)*m^3 + ((3*(4*b^4*c^3*d - 9*a*b^3*c^2*d^2 + 6*a^2*b^2*c*d^3 - a^3*b* \\
& d^4)*e + (8*b^4*c^4 - 14*a*b^3*c^3*d - 3*a^2*b^2*c^2*d^2 + 16*a^3*b*c*d^3 - \\
& 7*a^4*d^4)*f)*g + ((8*b^4*c^4 - 14*a*b^3*c^3*d - 3*a^2*b^2*c^2*d^2 + 16*a^ \\
& 3*b*c*d^3 - 7*a^4*d^4)*e + 5*(a*b^3*c^4 - 4*a^2*b^2*c^3*d + 5*a^3*b*c^2*d^2 \\
& - 2*a^4*c*d^3)*f)*h)*m^2 + 4*(15*b^4*c^3*d*e + (3*b^4*c^4 - 12*a*b^3*c^3*d \\
& - 12*a^2*b^2*c^2*d^2 + 8*a^3*b*c*d^3 - 2*a^4*d^4)*f)*g + 4*((3*b^4*c^4 - 1 \\
& 2*a*b^3*c^3*d - 12*a^2*b^2*c^2*d^2 + 8*a^3*b*c*d^3 - 2*a^4*d^4)*e + 5*(4*a^ \\
& 3*b*c^2*d^2 - a^4*c*d^3)*f)*h + (((47*b^4*c^3*d - 60*a*b^3*c^2*d^2 + 15*a^2 \\
& *b^2*c*d^3 - 2*a^3*b*d^4)*e + (19*b^4*c^4 - 36*a*b^3*c^3*d - 15*a^2*b^2*c^2 \\
& *d^2 + 46*a^3*b*c*d^3 - 14*a^4*d^4)*f)*g + ((19*b^4*c^4 - 36*a*b^3*c^3*d - \\
& 15*a^2*b^2*c^2*d^2 + 46*a^3*b*c*d^3 - 14*a^4*d^4)*e + (4*a*b^3*c^4 - 41*a^2 \\
& *b^2*c^3*d + 66*a^3*b*c^2*d^2 - 29*a^4*c*d^3)*f)*h)*m)*x^2 + 2*(3*(4*a*b^3* \\
& c^4 - 6*a^2*b^2*c^3*d + 4*a^3*b*c^2*d^2 - a^4*c*d^3)*e - (6*a^2*b^2*c^4 - 4 \\
& *a^3*b*c^3*d + a^4*c^2*d^2)*f)*g - 2*((6*a^2*b^2*c^4 - 4*a^3*b*c^3*d + a^4* \\
& c^2*d^2)*e - (4*a^3*b*c^4 - a^4*c^3*d)*f)*h + (((26*a*b^3*c^4 - 57*a^2*b^2* \\
& c^3*d + 42*a^3*b*c^2*d^2 - 11*a^4*c*d^3)*e - (7*a^2*b^2*c^4 - 10*a^3*b*c^3* \\
& d + 3*a^4*c^2*d^2)*f)*g - ((7*a^2*b^2*c^4 - 10*a^3*b*c^3*d + 3*a^4*c^2*d^2) \\
& *e - 2*(a^3*b*c^4 - a^4*c^3*d)*f)*h)*m + (((a*b^3*c^4 - 3*a^2*b^2*c^3*d + 3 \\
& *a^3*b*c^2*d^2 - a^4*c*d^3)*e*h + ((b^4*c^4 - 2*a*b^3*c^3*d + 2*a^3*b*c*d^3 \\
& - a^4*d^4)*e + (a*b^3*c^4 - 3*a^2*b^2*c^3*d + 3*a^3*b*c^2*d^2 - a^4*c*d^3) \\
& *f)*g)*m^3 + ((3*(3*b^4*c^4 - 4*a*b^3*c^3*d - 3*a^2*b^2*c^2*d^2 + 6*a^3*b*c \\
& *d^3 - 2*a^4*d^4)*e + (7*a*b^3*c^4 - 22*a^2*b^2*c^3*d + 23*a^3*b*c^2*d^2 - \\
& 8*a^4*c*d^3)*f)*g + ((7*a*b^3*c^4 - 22*a^2*b^2*c^3*d + 23*a^3*b*c^2*d^2 - 8 \\
& *a^4*c*d^3)*e - 2*(a^2*b^2*c^4 - 2*a^3*b*c^3*d + a^4*c^2*d^2)*f)*h)*m^2 + 2 \\
& *(3*(4*b^4*c^4 + 4*a*b^3*c^3*d - 6*a^2*b^2*c^2*d^2 + 4*a^3*b*c*d^3 - a^4*d^ \\
& 4)*e - 5*(6*a^2*b^2*c^3*d - 4*a^3*b*c^2*d^2 + a^4*c*d^3)*f)*g - 10*((6*a^2* \\
& b^2*c^3*d - 4*a^3*b*c^2*d^2 + a^4*c*d^3)*e - (4*a^3*b*c^3*d - a^4*c^2*d^2)* \\
& f)*h + (((26*b^4*c^4 - 10*a*b^3*c^3*d - 45*a^2*b^2*c^2*d^2 + 40*a^3*b*c*d^3 \\
& - 11*a^4*d^4)*e + (12*a*b^3*c^4 - 55*a^2*b^2*c^3*d + 60*a^3*b*c^2*d^2 - 17 \\
& *a^4*c*d^3)*f)*g + ((12*a*b^3*c^4 - 55*a^2*b^2*c^3*d + 60*a^3*b*c^2*d^2 - 1 \\
& 7*a^4*c*d^3)*e - 4*(2*a^2*b^2*c^4 - 5*a^3*b*c^3*d + 3*a^4*c^2*d^2)*f)*h)*m) \\
& *x)*(b*x + a)^m*(d*x + c)^(-m - 5)/(24*b^4*c^4 - 96*a*b^3*c^3*d + 144*a^2*b \\
& ^2*c^2*d^2 - 96*a^3*b*c*d^3 + 24*a^4*d^4 + (b^4*c^4 - 4*a*b^3*c^3*d + 6*a^2
\end{aligned}$$

```
*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*m^4 + 10*(b^4*c^4 - 4*a*b^3*c^3*d +
  6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*m^3 + 35*(b^4*c^4 - 4*a*b^3*c
^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*m^2 + 50*(b^4*c^4 - 4*a
*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*m)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b*x+a)**m*(d*x+c)**(-5-m)*(f*x+e)*(h*x+g), x)

[Out] Timed out

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (fx + e)(hx + g)(bx + a)^m(dx + c)^{-m-5} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b*x+a)^m*(d*x+c)^(-5-m)*(f*x+e)*(h*x+g), x, algorithm="giac")

[Out] integrate((f*x + e)*(h*x + g)*(b*x + a)^m*(d*x + c)^(-m - 5), x)

3.132 $\int (a + bx)^3 (c + dx)^{-4-m} (e + fx)^m (g + hx) dx$

Optimal. Leaf size=815

$$\frac{h(a + bx)^3 (e + fx)^{m+1} (c + dx)^{-m-3}}{df} + \frac{(bc - ad)^2 (adf + b(cf(m + 2) - de(m + 3))) (cfh(m + 4) - d(fg + eh(m + 3))) (e + fx)^m}{d^4 f^2 (de - cf)(m + 3)}$$

```
[Out] ((b*c - a*d)^2*(a*d*f + b*(c*f*(2 + m) - d*e*(3 + m)))*(c*f*h*(4 + m) - d*(f*g + e*h*(3 + m)))*(c + d*x)^(-3 - m)*(e + f*x)^(1 + m))/(d^4*f^2*(d*e - c*f)*(3 + m)) - (b*(b*c - a*d)*(c*f*h*(4 + m) - d*(f*g + e*h*(3 + m)))*(a + b*x)*(c + d*x)^(-3 - m)*(e + f*x)^(1 + m))/(d^3*f^2) + (h*(a + b*x)^3*(c + d*x)^(-3 - m)*(e + f*x)^(1 + m))/(d*f) - ((b*c - a*d)^2*(3*a*d*f*h - b*(c*f*h*(4 + m) - d*(f*g + e*h*m)))*(c + d*x)^(-2 - m)*(e + f*x)^(1 + m))/(d^4*f*(d*e - c*f)*(2 + m)) + ((b*c - a*d)*(c*f*h*(4 + m) - d*(f*g + e*h*(3 + m)))*(2*a^2*d^2*f^2 + 2*a*b*d*f*(c*f*(1 + m) - d*e*(3 + m)) + b^2*(c^2*f^2*(2 + 3*m + m^2) - 2*c*d*e*f*(3 + 4*m + m^2) + d^2*e^2*(6 + 5*m + m^2)))*(c + d*x)^(-2 - m)*(e + f*x)^(1 + m))/(d^4*f^2*(d*e - c*f)^2*(2 + m)*(3 + m)) - ((b*c - a*d)*(a*d*f - b*(2*d*e*(2 + m) - c*f*(3 + 2*m)))*(3*a*d*f*h - b*(c*f*h*(4 + m) - d*(f*g + e*h*m)))*(c + d*x)^(-1 - m)*(e + f*x)^(1 + m))/(d^4*f*(d*e - c*f)^2*(1 + m)*(2 + m)) - ((b*c - a*d)*(c*f*h*(4 + m) - d*(f*g + e*h*(3 + m)))*(2*a^2*d^2*f^2 + 2*a*b*d*f*(c*f*(1 + m) - d*e*(3 + m)) + b^2*(c^2*f^2*(2 + 3*m + m^2) - 2*c*d*e*f*(3 + 4*m + m^2) + d^2*e^2*(6 + 5*m + m^2)))*(c + d*x)^(-1 - m)*(e + f*x)^(1 + m))/(d^4*f*(d*e - c*f)^3*(1 + m)*(2 + m)*(3 + m)) - (b^2*(3*a*d*f*h - b*(c*f*h*(4 + m) - d*(f*g + e*h*m)))*(e + f*x)^m*Hypergeometric2F1[-m, -m, 1 - m, -((f*(c + d*x))/(d*e - c*f))])/(d^5*f*m*(c + d*x)^m*((d*(e + f*x))/(d*e - c*f))^m)
```

Rubi [A] time = 1.43461, antiderivative size = 803, normalized size of antiderivative = 0.99, number of steps used = 10, number of rules used = 9, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}} = 0.29$, Rules used = {153, 159, 89, 79, 70, 69, 90, 45, 37}

$$\frac{h(a + bx)^3 (e + fx)^{m+1} (c + dx)^{-m-3}}{df} + \frac{(bc - ad)^2 (adf + bc(m + 2)f - bde(m + 3)) (cfh(m + 4) - d(fg + eh(m + 3))) (e + fx)^m}{d^4 f^2 (de - cf)(m + 3)}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x)^3*(c + d*x)^(-4 - m)*(e + f*x)^m*(g + h*x), x]
```

```
[Out] ((b*c - a*d)^2*(a*d*f + b*c*f*(2 + m) - b*d*e*(3 + m))*(c*f*h*(4 + m) - d*(f*g + e*h*(3 + m)))*(c + d*x)^(-3 - m)*(e + f*x)^(1 + m))/(d^4*f^2*(d*e - c
```

```

*f)*(3 + m)) - (b*(b*c - a*d)*(c*f*h*(4 + m) - d*(f*g + e*h*(3 + m)))*(a +
b*x)*(c + d*x)^(-3 - m)*(e + f*x)^(1 + m))/(d^3*f^2) + (h*(a + b*x)^3*(c +
d*x)^(-3 - m)*(e + f*x)^(1 + m))/(d*f) - ((b*c - a*d)^2*(b*d*f*g + 3*a*d*f*
h + b*d*e*h*m - b*c*f*h*(4 + m))*(c + d*x)^(-2 - m)*(e + f*x)^(1 + m))/(d^4
*f*(d*e - c*f)*(2 + m)) - ((b*c - a*d)*(d*f*g + d*e*h*(3 + m) - c*f*h*(4 +
m))*(2*a^2*d^2*f^2 + 2*a*b*d*f*(c*f*(1 + m) - d*e*(3 + m)) + b^2*(c^2*f^2*(
2 + 3*m + m^2) - 2*c*d*e*f*(3 + 4*m + m^2) + d^2*e^2*(6 + 5*m + m^2)))*(c +
d*x)^(-2 - m)*(e + f*x)^(1 + m))/(d^4*f^2*(d*e - c*f)^2*(2 + m)*(3 + m)) -
((b*c - a*d)*(b*d*f*g + 3*a*d*f*h + b*d*e*h*m - b*c*f*h*(4 + m))*(a*d*f -
2*b*d*e*(2 + m) + b*c*f*(3 + 2*m))*(c + d*x)^(-1 - m)*(e + f*x)^(1 + m))/(d
^4*f*(d*e - c*f)^2*(1 + m)*(2 + m)) + ((b*c - a*d)*(d*f*g + d*e*h*(3 + m) -
c*f*h*(4 + m))*(2*a^2*d^2*f^2 + 2*a*b*d*f*(c*f*(1 + m) - d*e*(3 + m)) + b^
2*(c^2*f^2*(2 + 3*m + m^2) - 2*c*d*e*f*(3 + 4*m + m^2) + d^2*e^2*(6 + 5*m +
m^2)))*(c + d*x)^(-1 - m)*(e + f*x)^(1 + m))/(d^4*f*(d*e - c*f)^3*(1 + m)*
(2 + m)*(3 + m)) - (b^2*(b*d*f*g + 3*a*d*f*h + b*d*e*h*m - b*c*f*h*(4 + m))
*(e + f*x)^m*Hypergeometric2F1[-m, -m, 1 - m, -(f*(c + d*x))/(d*e - c*f)])
)/(d^5*f*m*(c + d*x)^m*((d*(e + f*x))/(d*e - c*f))^m)

```

Rule 153

```

Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_)*((e_.) + (f_.)*(x_
))^p_)*((g_.) + (h_.)*(x_)), x_Symbol] := Simp[(h*(a + b*x)^m*(c + d*x)^(n
+ 1)*(e + f*x)^(p + 1))/(d*f*(m + n + p + 2)), x] + Dist[1/(d*f*(m + n + p
+ 2)), Int[(a + b*x)^(m - 1)*(c + d*x)^n*(e + f*x)^p*Simp[a*d*f*g*(m + n +
p + 2) - h*(b*c*e*m + a*(d*e*(n + 1) + c*f*(p + 1)) + (b*d*f*g*(m + n + p
+ 2) + h*(a*d*f*m - b*(d*e*(m + n + 1) + c*f*(m + p + 1)))]*x, x], x] /
; FreeQ[{a, b, c, d, e, f, g, h, n, p}, x] && GtQ[m, 0] && NeQ[m + n + p +
2, 0] && IntegerQ[m]

```

Rule 159

```

Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_)*((e_.) + (f_.)*(x_
))^p_)*((g_.) + (h_.)*(x_)), x_Symbol] := Dist[h/b, Int[(a + b*x)^(m + 1)*(
c + d*x)^n*(e + f*x)^p, x], x] + Dist[(b*g - a*h)/b, Int[(a + b*x)^m*(c + d
*x)^n*(e + f*x)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n, p}, x] &&
(SumSimplerQ[m, 1] || (!SumSimplerQ[n, 1] && !SumSimplerQ[p, 1]))

```

Rule 89

```

Int[((a_.) + (b_.)*(x_))^(2*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(
p_.), x_Symbol] := Simp[((b*c - a*d)^2*(c + d*x)^(n + 1)*(e + f*x)^(p + 1)
)/(d^2*(d*e - c*f)*(n + 1)), x] - Dist[1/(d^2*(d*e - c*f)*(n + 1)), Int[(c
+ d*x)^(n + 1)*(e + f*x)^p*Simp[a^2*d^2*f*(n + p + 2) + b^2*c*(d*e*(n + 1)
+ c*f*(p + 1)) - 2*a*b*d*(d*e*(n + 1) + c*f*(p + 1)) - b^2*d*(d*e - c*f)*(n
+ 1)*x, x], x] /; FreeQ[{a, b, c, d, e, f, n, p}, x] && (LtQ[n, -1] ||

```

(EqQ[n + p + 3, 0] && NeQ[n, -1] && (SumSimplerQ[n, 1] || !SumSimplerQ[p, 1]))))

Rule 79

Int[((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p_.), x_Symbol] := -Simp[((b*e - a*f)*(c + d*x)^(n + 1)*(e + f*x)^(p + 1))/(f*(p + 1)*(c*f - d*e)), x] - Dist[(a*d*f*(n + p + 2) - b*(d*e*(n + 1) + c*f*(p + 1)))/(f*(p + 1)*(c*f - d*e)), Int[(c + d*x)^n*(e + f*x)^Simplify[p + 1], x], x] /; FreeQ[{a, b, c, d, e, f, n, p}, x] && !RationalQ[p] && SumSimplerQ[p, 1]

Rule 70

Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] := Dist[(c + d*x)^FracPart[n]/((b/(b*c - a*d))^IntPart[n]*((b*(c + d*x))/(b*c - a*d))^FracPart[n]), Int[(a + b*x)^m*Simp[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d), x]^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && !IntegerQ[m] && !IntegerQ[n] && (RationalQ[m] || !SimplerQ[n + 1, m + 1])

Rule 69

Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] := Simp[((a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a + b*x))/(b*c - a*d))]/(b*(m + 1)*(b/(b*c - a*d))^n), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && !IntegerQ[m] && !IntegerQ[n] && GtQ[b/(b*c - a*d), 0] && (RationalQ[m] || !(RationalQ[n] && GtQ[-(d/(b*c - a*d)), 0]))

Rule 90

Int[((a_.) + (b_.)*(x_))^2*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p_.), x_Symbol] := Simp[(b*(a + b*x)*(c + d*x)^(n + 1)*(e + f*x)^(p + 1))/(d*f*(n + p + 3)), x] + Dist[1/(d*f*(n + p + 3)), Int[(c + d*x)^n*(e + f*x)^p*Simp[a^2*d*f*(n + p + 3) - b*(b*c*e + a*(d*e*(n + 1) + c*f*(p + 1))) + b*(a*d*f*(n + p + 4) - b*(d*e*(n + 2) + c*f*(p + 2)))*x, x], x] /; FreeQ[{a, b, c, d, e, f, n, p}, x] && NeQ[n + p + 3, 0]

Rule 45

Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] := Simp[((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*Simplify[m + n + 2])/((b*c - a*d)*(m + 1)), Int[(a + b*x)^Simplify[m + 1]*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && !LtQ[Simplify[m + n + 2], 0] && NeQ[m, -1] && !(LtQ[m, -1] && LtQ[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && (SumSimpler

Q[m, 1] || !SumSimplerQ[n, 1])

Rule 37

Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] := Simp
 [((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] /; FreeQ[{
 a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && EqQ[m + n + 2, 0] && NeQ[m, -
 1]

Rubi steps

$$\begin{aligned}
 \int (a + bx)^3(c + dx)^{-4-m}(e + fx)^m(g + hx) dx &= \frac{h(a + bx)^3(c + dx)^{-3-m}(e + fx)^{1+m}}{df} + \frac{\int (a + bx)^2(c + dx)^{-4-m}(e + fx)^m}{df} \\
 &= \frac{h(a + bx)^3(c + dx)^{-3-m}(e + fx)^{1+m}}{df} - \frac{((bc - ad)(dfg + deh(3 + m)) - cfh(4 + m))(a + bx)(c + dx)^{-3-m}(e + fx)^m}{d^3 f^2} \\
 &= -\frac{(bc - ad)^2(adf + bcf(2 + m) - bde(3 + m))(dfg + deh(3 + m)) - cfh(4 + m)}{d^4 f^2 (de - cf)(3 + m)} \\
 &= -\frac{(bc - ad)^2(adf + bcf(2 + m) - bde(3 + m))(dfg + deh(3 + m)) - cfh(4 + m)}{d^4 f^2 (de - cf)(3 + m)} \\
 &= -\frac{(bc - ad)^2(adf + bcf(2 + m) - bde(3 + m))(dfg + deh(3 + m)) - cfh(4 + m)}{d^4 f^2 (de - cf)(3 + m)}
 \end{aligned}$$

Mathematica [C] time = 48.597, size = 3579, normalized size = 4.39

Result too large to show

Warning: Unable to verify antiderivative.

[In] Integrate[(a + b*x)^3*(c + d*x)^(-4 - m)*(e + f*x)^m*(g + h*x), x]

[Out] (3*a*b^2*c^3*g*(c + d*x)^(-7 - m)*((c + d*x)/c)^(4 + m)*(e + f*x)^(3 + m)*(-
 2*c^3*e^3 - 6*c^2*d*e^3*x - 2*c^2*d*e^3*m*x + 2*c^3*e^2*f*m*x - 6*c*d^2*e^3*x^2 - 5*c*d^2*e^3*m*x^2 + 6*c^2*d*e^2*f*m*x^2 - c^3*e*f^2*m*x^2 - c*d^2*e^3*m^2*x^2 + 2*c^2*d*e^2*f*m^2*x^2 - c^3*e*f^2*m^2*x^2 - 6*c*d^2*e^2*f*x^3

$$\begin{aligned}
& + 6*c^2*d*e*f^2*x^3 - 2*c^3*f^3*x^3 - 5*c*d^2*e^2*f*m*x^3 + 8*c^2*d*e*f^2*m*x^3 - 3*c^3*f^3*m*x^3 - c*d^2*e^2*f*m^2*x^3 + 2*c^2*d*e*f^2*m^2*x^3 - c^3*f^3*m^2*x^3 + 2*c^3*e^3*((c*e + d*e*x)/(c*(e + f*x)))^m + 6*c^2*d*e^3*x*((c*e + d*e*x)/(c*(e + f*x)))^m + 6*c*d^2*e^3*x^2*((c*e + d*e*x)/(c*(e + f*x)))^m + 2*d^3*e^3*x^3*((c*e + d*e*x)/(c*(e + f*x)))^m)/(e^3*(d*e - c*f)^3*(1 + m)*(2 + m)*(3 + m)*((c*e + d*e*x)/(c*(e + f*x)))^m*((e + f*x)/e)^m*(1 + (f*x)/e)^3) + (3*a^2*b*c^3*h*(c + d*x)^(-7 - m)*((c + d*x)/c)^(4 + m)*(e + f*x)^(3 + m)*(-2*c^3*e^3 - 6*c^2*d*e^3*x - 2*c^2*d*e^3*m*x + 2*c^3*e^2*f*m*x - 6*c*d^2*e^3*x^2 - 5*c*d^2*e^3*m*x^2 + 6*c^2*d*e^2*f*m*x^2 - c^3*e*f^2*m*x^2 - c*d^2*e^3*m^2*x^2 + 2*c^2*d*e^2*f*m^2*x^2 - c^3*e*f^2*m^2*x^2 - 6*c*d^2*e^2*f*x^3 + 6*c^2*d*e*f^2*x^3 - 2*c^3*f^3*x^3 - 5*c*d^2*e^2*f*m*x^3 + 8*c^2*d*e*f^2*m*x^3 - 3*c^3*f^3*m*x^3 - c*d^2*e^2*f*m^2*x^3 + 2*c^2*d*e*f^2*m^2*x^3 - c^3*f^3*m^2*x^3 + 2*c^3*e^3*((c*e + d*e*x)/(c*(e + f*x)))^m + 6*c^2*d*e^3*x*((c*e + d*e*x)/(c*(e + f*x)))^m + 6*c*d^2*e^3*x^2*((c*e + d*e*x)/(c*(e + f*x)))^m + 2*d^3*e^3*x^3*((c*e + d*e*x)/(c*(e + f*x)))^m)/(e^3*(d*e - c*f)^3*(1 + m)*(2 + m)*(3 + m)*((c*e + d*e*x)/(c*(e + f*x)))^m*((e + f*x)/e)^m*(1 + (f*x)/e)^3) + (b^3*g*x^4*(c + d*x)^(-4 - m)*((c + d*x)/c)^(4 + m)*(e + f*x)^m*AppellF1[4, 4 + m, -m, 5, -((d*x)/c), -((f*x)/e)]/(4*((e + f*x)/e)^m) + (3*a*b^2*h*x^4*(c + d*x)^(-4 - m)*((c + d*x)/c)^(4 + m)*(e + f*x)^m*AppellF1[4, 4 + m, -m, 5, -((d*x)/c), -((f*x)/e)]/(4*((e + f*x)/e)^m) + (b^3*h*x^5*(c + d*x)^(-4 - m)*((c + d*x)/c)^(4 + m)*(e + f*x)^m*AppellF1[5, 4 + m, -m, 6, -((d*x)/c), -((f*x)/e)]/(5*((e + f*x)/e)^m) + (3*a^2*b*g*(c + d*x)^(-4 - m)*((c + d*x)/c)^(4 + m)*(1 + (d*x)/c)^(-4 - m)*(e + f*x)^m*((c*(e + f*x))/(e*(c + d*x)))^(-1 - m)*(1 + (f*x)/e)^(1 + m)*(c*(4 + m)*(3*e + f*x)*(-2*d^3*e^3*x^3 + c^3*(-2*e^2*f*m*x*((c*(e + f*x))/(e*(c + d*x))))^m + e*f^2*m*(1 + m)*x^2*((c*(e + f*x))/(e*(c + d*x)))^m + f^3*(2 + 3*m + m^2)*x^3*((c*(e + f*x))/(e*(c + d*x)))^m + 2*e^3*(-1 + ((c*(e + f*x))/(e*(c + d*x))))^m) - 2*c^2*d*e*x*(e*f*m*(3 + m)*x*((c*(e + f*x))/(e*(c + d*x)))^m + f^2*(3 + 4*m + m^2)*x^2*((c*(e + f*x))/(e*(c + d*x)))^m - e^2*(-3 + 3*((c*(e + f*x))/(e*(c + d*x))))^m + m*((c*(e + f*x))/(e*(c + d*x)))^m) + c*d^2*e^2*x^2*(f*(6 + 5*m + m^2)*x*((c*(e + f*x))/(e*(c + d*x)))^m + e*(-6 + 6*((c*(e + f*x))/(e*(c + d*x))))^m + 5*m*((c*(e + f*x))/(e*(c + d*x)))^m + m^2*((c*(e + f*x))/(e*(c + d*x))))^m)*Gamma[4 + m] - (2*d^4*e^4*(1 + m)*x^4 - 2*c*d^3*e^3*x^3*(-3*e*m + f*(4 + m)*x) + c^4*(e^2*f^2*(-5 + m)*m*x^2*((c*(e + f*x))/(e*(c + d*x)))^m + 2*e*f^3*m*(1 + m)*x^3*((c*(e + f*x))/(e*(c + d*x)))^m + f^4*(2 + 3*m + m^2)*x^4*((c*(e + f*x))/(e*(c + d*x)))^m + 6*e^4*(-1 + ((c*(e + f*x))/(e*(c + d*x))))^m - 2*e^3*f*x*(4 + m - 4*((c*(e + f*x))/(e*(c + d*x))))^m + 2*m*((c*(e + f*x))/(e*(c + d*x)))^m) - 2*c^3*d*e*x*(2*e*f^2*m*(4 + m)*x^2*((c*(e + f*x))/(e*(c + d*x)))^m + f^3*(4 + 5*m + m^2)*x^3*((c*(e + f*x))/(e*(c + d*x)))^m + e^2*f*(4 + m)*x*(3 - 3*((c*(e + f*x))/(e*(c + d*x))))^m + m*((c*(e + f*x))/(e*(c + d*x)))^m) - e^3*(-8 + m + 8*((c*(e + f*x))/(e*(c + d*x))))^m + 2*m*((c*(e + f*x))/(e*(c + d*x)))^m) + c^2*d^2*e^2*x^2*(f^2*(12 + 7*m + m^2)*x^2*((c*(e + f*x))/(e*(c + d*x)))^m + 2*e*f*(4 + m)*x*(-3 + 3*((c*(e + f*x))/(e*(c + d*x))))^m + m*((c*(e + f*x))/(e*(c + d*x)))^m) + e^2*(m^2*((c*(e + f*x))/(e*(c + d*x)))^m + 12*(-1 + ((c
\end{aligned}$$

```

*(e + f*x))/(e*(c + d*x)))^m) + m*(6 + 7*((c*(e + f*x))/(e*(c + d*x)))^m))
)*Gamma[5 + m]])/(2*c*e*(-(d*e) + c*f)^3*(1 + m)*(2 + m)*(3 + m)*(4 + m)*x*
((e + f*x)/e)^m*Gamma[4 + m]) + (a^3*h*(c + d*x)^(-4 - m)*((c + d*x)/c)^(4
+ m)*(1 + (d*x)/c)^(-4 - m)*(e + f*x)^m*((c*(e + f*x))/(e*(c + d*x)))^(-1 -
m)*(1 + (f*x)/e)^(1 + m)*(c*(4 + m)*(3*e + f*x)*(-2*d^3*e^3*x^3 + c^3*(-2*
e^2*f*m*x*((c*(e + f*x))/(e*(c + d*x)))^m + e*f^2*m*(1 + m)*x^2*((c*(e + f*
x))/(e*(c + d*x)))^m + f^3*(2 + 3*m + m^2)*x^3*((c*(e + f*x))/(e*(c + d*x))
)^m + 2*e^3*(-1 + ((c*(e + f*x))/(e*(c + d*x)))^m)) - 2*c^2*d*e*x*(e*f*m*(3
+ m)*x*((c*(e + f*x))/(e*(c + d*x)))^m + f^2*(3 + 4*m + m^2)*x^2*((c*(e +
f*x))/(e*(c + d*x)))^m - e^2*(-3 + 3*((c*(e + f*x))/(e*(c + d*x)))^m + m*((
c*(e + f*x))/(e*(c + d*x)))^m)) + c*d^2*e^2*x^2*(f*(6 + 5*m + m^2)*x*((c*(e
+ f*x))/(e*(c + d*x)))^m + e*(-6 + 6*((c*(e + f*x))/(e*(c + d*x)))^m + 5*m
*((c*(e + f*x))/(e*(c + d*x)))^m + m^2*((c*(e + f*x))/(e*(c + d*x)))^m))*G
amma[4 + m] - (2*d^4*e^4*(1 + m)*x^4 - 2*c*d^3*e^3*x^3*(-3*e*m + f*(4 + m)*
x) + c^4*(e^2*f^2*(-5 + m)*m*x^2*((c*(e + f*x))/(e*(c + d*x)))^m + 2*e*f^3*
m*(1 + m)*x^3*((c*(e + f*x))/(e*(c + d*x)))^m + f^4*(2 + 3*m + m^2)*x^4*((c
*(e + f*x))/(e*(c + d*x)))^m + 6*e^4*(-1 + ((c*(e + f*x))/(e*(c + d*x)))^m)
- 2*e^3*f*x*(4 + m - 4*((c*(e + f*x))/(e*(c + d*x)))^m + 2*m*((c*(e + f*x)
)/(e*(c + d*x)))^m)) - 2*c^3*d*e*x*(2*e*f^2*m*(4 + m)*x^2*((c*(e + f*x))/(e
*(c + d*x)))^m + f^3*(4 + 5*m + m^2)*x^3*((c*(e + f*x))/(e*(c + d*x)))^m +
e^2*f*(4 + m)*x*(3 - 3*((c*(e + f*x))/(e*(c + d*x)))^m + m*((c*(e + f*x))/(
e*(c + d*x)))^m) - e^3*(-8 + m + 8*((c*(e + f*x))/(e*(c + d*x)))^m + 2*m*((
c*(e + f*x))/(e*(c + d*x)))^m) + c^2*d^2*e^2*x^2*(f^2*(12 + 7*m + m^2)*x^2
*((c*(e + f*x))/(e*(c + d*x)))^m + 2*e*f*(4 + m)*x*(-3 + 3*((c*(e + f*x))/(
e*(c + d*x)))^m + m*((c*(e + f*x))/(e*(c + d*x)))^m) + e^2*(m^2*((c*(e + f*
x))/(e*(c + d*x)))^m + 12*(-1 + ((c*(e + f*x))/(e*(c + d*x)))^m) + m*(6 + 7
*((c*(e + f*x))/(e*(c + d*x)))^m)))*Gamma[5 + m]])/(2*c*e*(-(d*e) + c*f)^3
*(1 + m)*(2 + m)*(3 + m)*(4 + m)*x*((e + f*x)/e)^m*Gamma[4 + m]) + (a^3*f^3
*g*(e + f*x)^(1 + m)*(1 + (d*(e + f*x))/((c - (d*e)/f)*f))^m*Hypergeometric
2F1[1 + m, 4 + m, 2 + m, -((d*(e + f*x))/((c - (d*e)/f)*f))]/((-d*e) + c*
f)^4*(1 + m)*(c - (d*e)/f + (d*(e + f*x))/f)^m)

```

Maple [F] time = 0.063, size = 0, normalized size = 0.

$$\int (bx + a)^3 (dx + c)^{-4-m} (fx + e)^m (hx + g) dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b*x+a)^3*(d*x+c)^(-4-m)*(f*x+e)^m*(h*x+g), x)

[Out] int((b*x+a)^3*(d*x+c)^(-4-m)*(f*x+e)^m*(h*x+g), x)

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (bx + a)^3 (hx + g)(dx + c)^{-m-4} (fx + e)^m dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b*x+a)^3*(d*x+c)^(-4-m)*(f*x+e)^m*(h*x+g),x, algorithm="maxima")

[Out] integrate((b*x + a)^3*(h*x + g)*(d*x + c)^(-m - 4)*(f*x + e)^m, x)

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\left(b^3hx^4 + a^3g + (b^3g + 3ab^2h)x^3 + 3(ab^2g + a^2bh)x^2 + (3a^2bg + a^3h)x\right)(dx + c)^{-m-4}(fx + e)^m, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b*x+a)^3*(d*x+c)^(-4-m)*(f*x+e)^m*(h*x+g),x, algorithm="fricas")

[Out] integral((b^3*h*x^4 + a^3*g + (b^3*g + 3*a*b^2*h)*x^3 + 3*(a*b^2*g + a^2*b*h)*x^2 + (3*a^2*b*g + a^3*h)*x)*(d*x + c)^(-m - 4)*(f*x + e)^m, x)

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b*x+a)**3*(d*x+c)**(-4-m)*(f*x+e)**m*(h*x+g),x)

[Out] Timed out

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (bx + a)^3 (hx + g)(dx + c)^{-m-4} (fx + e)^m dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^3*(d*x+c)^(-4-m)*(f*x+e)^m*(h*x+g),x, algorithm="giac")
```

```
[Out] integrate((b*x + a)^3*(h*x + g)*(d*x + c)^(-m - 4)*(f*x + e)^m, x)
```

3.133 $\int (a + bx)^2 (c + dx)^{-4-m} (e + fx)^m (g + hx) dx$

Optimal. Leaf size=572

$$\frac{(dg - ch)(c + dx)^{-m-2}(e + fx)^{m+1} (b^2(m+2)(de - cf)(cf(m+1) - de(m+3)) - 2df(a^2df + ab(cf(m+1) - de(m+3))))}{d^3 f(m+2)(m+3)(de - cf)^2}$$

[Out] $((b*c - a*d)*(d*g - c*h)*(a*d*f + b*(c*f*(2 + m) - d*e*(3 + m)))*(c + d*x)^{-3 - m}*(e + f*x)^{(1 + m)})/(d^3*f*(d*e - c*f)*(3 + m)) - (b*(d*g - c*h)*(a + b*x)*(c + d*x)^{-3 - m}*(e + f*x)^{(1 + m)})/(d^2*f) - ((b*c - a*d)^2*h*(c + d*x)^{-2 - m}*(e + f*x)^{(1 + m)})/(d^3*(d*e - c*f)*(2 + m)) - ((d*g - c*h)*(b^2*(d*e - c*f)*(2 + m)*(c*f*(1 + m) - d*e*(3 + m)) - 2*d*f*(b^2*c*e + a^2*d*f + a*b*(c*f*(1 + m) - d*e*(3 + m))))*(c + d*x)^{-2 - m}*(e + f*x)^{(1 + m)})/(d^3*f*(d*e - c*f)^2*(2 + m)*(3 + m)) - ((b*c - a*d)*h*(a*d*f - b*(2*d*e*(2 + m) - c*f*(3 + 2*m)))*(c + d*x)^{-1 - m}*(e + f*x)^{(1 + m)})/(d^3*(d*e - c*f)^2*(1 + m)*(2 + m)) + ((d*g - c*h)*(b^2*(d*e - c*f)*(2 + m)*(c*f*(1 + m) - d*e*(3 + m)) - 2*d*f*(b^2*c*e + a^2*d*f + a*b*(c*f*(1 + m) - d*e*(3 + m))))*(c + d*x)^{-1 - m}*(e + f*x)^{(1 + m)})/(d^3*(d*e - c*f)^3*(1 + m)*(2 + m)*(3 + m)) - (b^2*h*(e + f*x)^m*Hypergeometric2F1[-m, -m, 1 - m, -(f*(c + d*x))/(d*e - c*f)])/(d^4*m*(c + d*x)^m*((d*(e + f*x))/(d*e - c*f))^m)$

Rubi [A] time = 0.662017, antiderivative size = 566, normalized size of antiderivative = 0.99, number of steps used = 9, number of rules used = 8, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}} = 0.258$, Rules used = {159, 89, 79, 70, 69, 90, 45, 37}

$$\frac{(dg - ch)(c + dx)^{-m-2}(e + fx)^{m+1} (b^2(m+2)(de - cf)(cf(m+1) - de(m+3)) - 2df(a^2df + b(acf(m+1) - ade(m+3))))}{d^3 f(m+2)(m+3)(de - cf)^2}$$

Antiderivative was successfully verified.

[In] Int[(a + b*x)^2*(c + d*x)^(-4 - m)*(e + f*x)^m*(g + h*x), x]

[Out] $((b*c - a*d)*(d*g - c*h)*(a*d*f + b*c*f*(2 + m) - b*d*e*(3 + m))*(c + d*x)^{-3 - m}*(e + f*x)^{(1 + m)})/(d^3*f*(d*e - c*f)*(3 + m)) - (b*(d*g - c*h)*(a + b*x)*(c + d*x)^{-3 - m}*(e + f*x)^{(1 + m)})/(d^2*f) - ((b*c - a*d)^2*h*(c + d*x)^{-2 - m}*(e + f*x)^{(1 + m)})/(d^3*(d*e - c*f)*(2 + m)) - ((d*g - c*h)*(b^2*(d*e - c*f)*(2 + m)*(c*f*(1 + m) - d*e*(3 + m)) - 2*d*f*(a^2*d*f + b*(b*c*e + a*c*f*(1 + m) - a*d*e*(3 + m))))*(c + d*x)^{-2 - m}*(e + f*x)^{(1 + m)})/(d^3*f*(d*e - c*f)^2*(2 + m)*(3 + m)) - ((b*c - a*d)*h*(a*d*f - 2*b*d$

```

*e*(2 + m) + b*c*f*(3 + 2*m))*(c + d*x)^(-1 - m)*(e + f*x)^(1 + m))/(d^3*(d
*e - c*f)^2*(1 + m)*(2 + m)) + ((d*g - c*h)*(b^2*(d*e - c*f)*(2 + m)*(c*f*(
1 + m) - d*e*(3 + m)) - 2*d*f*(a^2*d*f + b*(b*c*e + a*c*f*(1 + m) - a*d*e*(
3 + m))))*(c + d*x)^(-1 - m)*(e + f*x)^(1 + m))/(d^3*(d*e - c*f)^3*(1 + m)*
(2 + m)*(3 + m)) - (b^2*h*(e + f*x)^m*Hypergeometric2F1[-m, -m, 1 - m, -(f
*(c + d*x))/(d*e - c*f))]/(d^4*m*(c + d*x)^m*((d*(e + f*x))/(d*e - c*f))^m
)

```

Rule 159

```

Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_)*((e_.) + (f_.)*(x_
))^p_)*((g_.) + (h_.)*(x_)), x_Symbol] :> Dist[h/b, Int[(a + b*x)^(m + 1)*(
c + d*x)^n*(e + f*x)^p, x], x] + Dist[(b*g - a*h)/b, Int[(a + b*x)^m*(c + d
*x)^n*(e + f*x)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n, p}, x] &&
(SumSimplerQ[m, 1] || (!SumSimplerQ[n, 1] && !SumSimplerQ[p, 1]))

```

Rule 89

```

Int[((a_.) + (b_.)*(x_))^(2*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(
p_.)), x_Symbol] :> Simp[((b*c - a*d)^2*(c + d*x)^(n + 1)*(e + f*x)^(p + 1)
)/(d^2*(d*e - c*f)*(n + 1)), x] - Dist[1/(d^2*(d*e - c*f)*(n + 1)), Int[(c
+ d*x)^(n + 1)*(e + f*x)^p*Simp[a^2*d^2*f*(n + p + 2) + b^2*c*(d*e*(n + 1)
+ c*f*(p + 1)) - 2*a*b*d*(d*e*(n + 1) + c*f*(p + 1)) - b^2*d*(d*e - c*f)*(n
+ 1)*x, x], x] /; FreeQ[{a, b, c, d, e, f, n, p}, x] && (LtQ[n, -1] ||
(EqQ[n + p + 3, 0] && NeQ[n, -1] && (SumSimplerQ[n, 1] || !SumSimplerQ[p,
1])))

```

Rule 79

```

Int[((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p
_.), x_Symbol] :> -Simp[((b*e - a*f)*(c + d*x)^(n + 1)*(e + f*x)^(p + 1))/(
f*(p + 1)*(c*f - d*e)), x] - Dist[(a*d*f*(n + p + 2) - b*(d*e*(n + 1) + c*f
*(p + 1)))/(f*(p + 1)*(c*f - d*e)), Int[(c + d*x)^n*(e + f*x)^Simplify[p +
1], x], x] /; FreeQ[{a, b, c, d, e, f, n, p}, x] && !RationalQ[p] && SumSi
mplerQ[p, 1]

```

Rule 70

```

Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Dist[(c
+ d*x)^FracPart[n]/((b/(b*c - a*d))^IntPart[n]*((b*(c + d*x))/(b*c - a*d))
^FracPart[n]), Int[(a + b*x)^m*Simp[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)
, x]^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && !In
tegerQ[m] && !IntegerQ[n] && (RationalQ[m] || !SimplerQ[n + 1, m + 1])

```

Rule 69

```
Int[((a_) + (b_)*(x_))^(m_)*((c_) + (d_)*(x_))^(n_), x_Symbol] := Simp[(((a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a + b*x))/(b*c - a*d))])/(b*(m + 1)*(b/(b*c - a*d))^n), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && !IntegerQ[m] && !IntegerQ[n] && GtQ[b/(b*c - a*d), 0] && (RationalQ[m] || !(RationalQ[n] && GtQ[-(d/(b*c - a*d)), 0]))
```

Rule 90

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p_.), x_Symbol] := Simp[(b*(a + b*x)*(c + d*x)^(n + 1)*(e + f*x)^(p + 1))/(d*f*(n + p + 3)), x] + Dist[1/(d*f*(n + p + 3)), Int[(c + d*x)^n*(e + f*x)^p*Simp[a^2*d*f*(n + p + 3) - b*(b*c*e + a*(d*e*(n + 1) + c*f*(p + 1)) + b*(a*d*f*(n + p + 4) - b*(d*e*(n + 2) + c*f*(p + 2)))*x, x], x] /; FreeQ[{a, b, c, d, e, f, n, p}, x] && NeQ[n + p + 3, 0]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] := Simp[((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*Simplify[m + n + 2])/((b*c - a*d)*(m + 1)), Int[(a + b*x)^Simplify[m + 1]*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && !LtQ[Simplify[m + n + 2], 0] && NeQ[m, -1] && !(LtQ[m, -1] && LtQ[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && (SumSimplerQ[m, 1] || !SumSimplerQ[n, 1])
```

Rule 37

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] := Simp[((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && EqQ[m + n + 2, 0] && NeQ[m, -1]
```

Rubi steps

$$\begin{aligned}
\int (a + bx)^2 (c + dx)^{-4-m} (e + fx)^m (g + hx) dx &= \frac{h \int (a + bx)^2 (c + dx)^{-3-m} (e + fx)^m dx}{d} + \frac{(dg - ch) \int (a + bx)^2 (c + dx)^{-4-m} dx}{d} \\
&= -\frac{b(dg - ch)(a + bx)(c + dx)^{-3-m} (e + fx)^{1+m}}{d^2 f} - \frac{(bc - ad)^2 h (c + dx)^{-2-m}}{d^3 (de - cf)(2 + m)} \\
&= \frac{(bc - ad)(dg - ch)(adf + bcf(2 + m) - bde(3 + m))(c + dx)^{-3-m} (e + fx)^m}{d^3 f (de - cf)(3 + m)} \\
&= \frac{(bc - ad)(dg - ch)(adf + bcf(2 + m) - bde(3 + m))(c + dx)^{-3-m} (e + fx)^m}{d^3 f (de - cf)(3 + m)} \\
&= \frac{(bc - ad)(dg - ch)(adf + bcf(2 + m) - bde(3 + m))(c + dx)^{-3-m} (e + fx)^m}{d^3 f (de - cf)(3 + m)}
\end{aligned}$$

Mathematica [A] time = 1.8164, size = 422, normalized size = 0.74

$$(c + dx)^{-m-3} (e + fx)^m \left(-h(m + 3)(c + dx)(de - cf) \left(df(m + 1)(e + fx)(bc - ad)^2 (de - cf) - (c + dx) \left(d(e + fx) (a^2 d^2 f^2 \right) \right) \right)$$

Antiderivative was successfully verified.

[In] Integrate[(a + b*x)^2*(c + d*x)^(-4 - m)*(e + f*x)^m*(g + h*x), x]

[Out] ((c + d*x)^(-3 - m)*(e + f*x)^m*(-(d*(d*g - c*h)*(e + f*x)*(-(b*c - a*d)*(d*e - c*f)^2*(1 + m)*(2 + m)*(a*d*f + b*c*f*(2 + m) - b*d*e*(3 + m))) + b*d*(d*e - c*f)^3*(1 + m)*(2 + m)*(3 + m)*(a + b*x) + (b^2*(d*e - c*f)*(2 + m)*(c*f*(1 + m) - d*e*(3 + m)) + 2*d*f*(-(a^2*d*f) - b*(b*c*e + a*c*f*(1 + m) - a*d*e*(3 + m))))*(c + d*x)*(-(c*f*(2 + m)) + d*(e + e*m - f*x)))) - (d*e - c*f)*h*(3 + m)*(c + d*x)*(d*(b*c - a*d)^2*f*(d*e - c*f)*(1 + m)*(e + f*x) - (c + d*x)*(d*(a^2*d^2*f^2 + 2*a*b*d*f*(c*f*(1 + m) - d*e*(2 + m)) + b^2*(-(c^2*f^2*(1 + m)) + d^2*e^2*(2 + m)))*(e + f*x) - (b^2*(d*e - c*f)^3*(2 + m)*Hypergeometric2F1[-1 - m, -1 - m, -m, (f*(c + d*x))/(-(d*e) + c*f)])/(d*(e + f*x))/(d*e - c*f)^m)))/(d^4*f*(d*e - c*f)^3*(1 + m)*(2 + m)*(3 + m))

Maple [F] time = 0.059, size = 0, normalized size = 0.

$$\int (bx + a)^2 (dx + c)^{-4-m} (fx + e)^m (hx + g) dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `int((b*x+a)^2*(d*x+c)^(-4-m)*(f*x+e)^m*(h*x+g),x)`

[Out] `int((b*x+a)^2*(d*x+c)^(-4-m)*(f*x+e)^m*(h*x+g),x)`

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (bx + a)^2 (hx + g)(dx + c)^{-m-4} (fx + e)^m dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((b*x+a)^2*(d*x+c)^(-4-m)*(f*x+e)^m*(h*x+g),x, algorithm="maxima")`

[Out] `integrate((b*x + a)^2*(h*x + g)*(d*x + c)^(-m - 4)*(f*x + e)^m, x)`

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\left(b^2hx^3 + a^2g + (b^2g + 2abh)x^2 + (2abg + a^2h)x\right)(dx + c)^{-m-4}(fx + e)^m, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((b*x+a)^2*(d*x+c)^(-4-m)*(f*x+e)^m*(h*x+g),x, algorithm="fricas")`

[Out] `integral((b^2*h*x^3 + a^2*g + (b^2*g + 2*a*b*h)*x^2 + (2*a*b*g + a^2*h)*x)*(d*x + c)^(-m - 4)*(f*x + e)^m, x)`

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((b*x+a)**2*(d*x+c)**(-4-m)*(f*x+e)**m*(h*x+g),x)`

[Out] Timed out

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (bx + a)^2 (hx + g)(dx + c)^{-m-4} (fx + e)^m dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b*x+a)^2*(d*x+c)^(-4-m)*(f*x+e)^m*(h*x+g),x, algorithm="giac")

[Out] integrate((b*x + a)^2*(h*x + g)*(d*x + c)^(-m - 4)*(f*x + e)^m, x)

3.134 $\int (a + bx)(c + dx)^{-4-m}(e + fx)^m(g + hx) dx$

Optimal. Leaf size=363

$$\frac{(c + dx)^{-m-2}(e + fx)^{m+1} (adf(cf h(m + 1) + d(2fg - eh(m + 3))) + b(c^2 f^2 h(m^2 + 3m + 2) + cdf(m + 1)(fg - 2eh(m + 3)))}{d^2 f(m + 2)(m + 3)(de - cf)^2}$$

[Out] $((b*(c^2*f^2*h*(2 + 3*m + m^2) - d^2*e*(3 + m)*(f*g - e*h*(2 + m)) + c*d*f*(1 + m)*(f*g - 2*e*h*(3 + m))) + a*d*f*(c*f*h*(1 + m) + d*(2*f*g - e*h*(3 + m))))*(c + d*x)^{-2 - m}*(e + f*x)^{(1 + m)}/(d^2*f*(d*e - c*f)^2*(2 + m)*(3 + m)) - ((b*(c^2*f^2*h*(2 + 3*m + m^2) - d^2*e*(3 + m)*(f*g - e*h*(2 + m)) + c*d*f*(1 + m)*(f*g - 2*e*h*(3 + m))) + a*d*f*(c*f*h*(1 + m) + d*(2*f*g - e*h*(3 + m))))*(c + d*x)^{-1 - m}*(e + f*x)^{(1 + m)}/(d^2*(d*e - c*f)^3*(1 + m)*(2 + m)*(3 + m)) - ((c + d*x)^{-3 - m}*(e + f*x)^{(1 + m)*(a*d*f*(d*g - c*h) - b*c*(c*f*h*(2 + m) + d*(f*g - e*h*(3 + m))) + b*d*(d*e - c*f)*h*(3 + m)*x))/(d^2*f*(d*e - c*f)*(3 + m))$

Rubi [A] time = 0.396708, antiderivative size = 360, normalized size of antiderivative = 0.99, number of steps used = 3, number of rules used = 3, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.103$, Rules used = {146, 45, 37}

$$\frac{(c + dx)^{-m-2}(e + fx)^{m+1} (adf(cf h(m + 1) - deh(m + 3) + 2dfg) + b(c^2 f^2 h(m^2 + 3m + 2) + cdf(m + 1)(fg - 2eh(m + 3))))}{d^2 f(m + 2)(m + 3)(de - cf)^2}$$

Antiderivative was successfully verified.

[In] Int[(a + b*x)*(c + d*x)^(-4 - m)*(e + f*x)^m*(g + h*x), x]

[Out] $((a*d*f*(2*d*f*g + c*f*h*(1 + m) - d*e*h*(3 + m)) + b*(c^2*f^2*h*(2 + 3*m + m^2) - d^2*e*(3 + m)*(f*g - e*h*(2 + m)) + c*d*f*(1 + m)*(f*g - 2*e*h*(3 + m))))*(c + d*x)^{-2 - m}*(e + f*x)^{(1 + m)}/(d^2*f*(d*e - c*f)^2*(2 + m)*(3 + m)) - ((a*d*f*(2*d*f*g + c*f*h*(1 + m) - d*e*h*(3 + m)) + b*(c^2*f^2*h*(2 + 3*m + m^2) - d^2*e*(3 + m)*(f*g - e*h*(2 + m)) + c*d*f*(1 + m)*(f*g - 2*e*h*(3 + m))))*(c + d*x)^{-1 - m}*(e + f*x)^{(1 + m)}/(d^2*(d*e - c*f)^3*(1 + m)*(2 + m)*(3 + m)) - ((c + d*x)^{-3 - m}*(e + f*x)^{(1 + m)*(a*d*f*(d*g - c*h) - b*c*(d*f*g + c*f*h*(2 + m) - d*e*h*(3 + m)) + b*d*(d*e - c*f)*h*(3 + m)*x))/(d^2*f*(d*e - c*f)*(3 + m))$

Rule 146

Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))*((g_.) + (h_.)*(x_)), x_Symbol] := Simp[(a^2*d*f*h*(n + 2) + b^2*d*e*g*(

```

m + n + 3) + a*b*(c*f*h*(m + 1) - d*(f*g + e*h)*(m + n + 3)) + b*f*h*(b*c -
a*d)*(m + 1)*x*(a + b*x)^(m + 1)*(c + d*x)^(n + 1)/(b^2*d*(b*c - a*d)*(m
+ 1)*(m + n + 3)), x] - Dist[(a^2*d^2*f*h*(n + 1)*(n + 2) + a*b*d*(n + 1)*
(2*c*f*h*(m + 1) - d*(f*g + e*h)*(m + n + 3)) + b^2*(c^2*f*h*(m + 1)*(m + 2
) - c*d*(f*g + e*h)*(m + 1)*(m + n + 3) + d^2*e*g*(m + n + 2)*(m + n + 3))
/(b^2*d*(b*c - a*d)*(m + 1)*(m + n + 3)), Int[(a + b*x)^(m + 1)*(c + d*x)^n
, x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n}, x] && ((GeQ[m, -2] && LtQ
[m, -1]) || SumSimplerQ[m, 1]) && NeQ[m, -1] && NeQ[m + n + 3, 0]

```

Rule 45

```

Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] := Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*S
implify[m + n + 2])/((b*c - a*d)*(m + 1)), Int[(a + b*x)^Simplify[m + 1]*(c
+ d*x)^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && I
LtQ[Simplify[m + n + 2], 0] && NeQ[m, -1] && !(LtQ[m, -1] && LtQ[n, -1] &&
(EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && (SumSimpler
Q[m, 1] || !SumSimplerQ[n, 1])

```

Rule 37

```

Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] := Simp
[((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] /; FreeQ[{
a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && EqQ[m + n + 2, 0] && NeQ[m, -
1]

```

Rubi steps

$$\begin{aligned}
\int (a + bx)(c + dx)^{-4-m}(e + fx)^m(g + hx) dx &= -\frac{(c + dx)^{-3-m}(e + fx)^{1+m}(adf(dg - ch) - bc(dfg + cfh(2 + m) - deh(3 + m)))}{d^2f(de - cf)(3 + m)} \\
&= \frac{(adf(2dfg + cfh(1 + m) - deh(3 + m)) + b(c^2f^2h(2 + 3m + m^2) - d^2e(m + n + 2))}{d^2f(de - cf)(3 + m)} \\
&= \frac{(adf(2dfg + cfh(1 + m) - deh(3 + m)) + b(c^2f^2h(2 + 3m + m^2) - d^2e(m + n + 2))}{d^2f(de - cf)(3 + m)}
\end{aligned}$$

Mathematica [A] time = 0.573499, size = 227, normalized size = 0.63

$$\frac{(c + dx)^{-m-3}(e + fx)^{m+1} \left(\frac{(c+dx)(cf(m+2)-d(em+e-fx))(adf(cf h(m+1)-deh(m+3)+2dfg)+b(c^2f^2h(m^2+3m+2)+cdf(m+1)(fg-2eh(m+3))+d^2e(m+n+2))}{(m+1)(m+2)(de-cf)^2} \right)}{d^2f(m+3)(cf - de)}$$

Antiderivative was successfully verified.

[In] Integrate[(a + b*x)*(c + d*x)^(-4 - m)*(e + f*x)^m*(g + h*x),x]

[Out] ((c + d*x)^(-3 - m)*(e + f*x)^(1 + m)*(a*d*f*(d*g - c*h) + ((a*d*f*(2*d*f*g + c*f*h*(1 + m) - d*e*h*(3 + m)) + b*(c^2*f^2*h*(2 + 3*m + m^2) + d^2*e*(3 + m))*(-f*g) + e*h*(2 + m)) + c*d*f*(1 + m)*(f*g - 2*e*h*(3 + m))))*(c + d*x)*(c*f*(2 + m) - d*(e + e*m - f*x)))/((d*e - c*f)^2*(1 + m)*(2 + m)) - b*(c^2*f*h*(2 + m) - d^2*e*h*(3 + m)*x + c*d*(-(e*h*(3 + m)) + f*(g + h*(3 + m)*x)))/((d^2*f*(-(d*e) + c*f)*(3 + m))

Maple [B] time = 0.008, size = 906, normalized size = 2.5

$$(dx + c)^{-3-m} (fx + e)^{1+m} (-bc^2 f^2 h m^2 x^2 + 2 bc d e f h m^2 x^2 - bd^2 e^2 h m^2 x^2 - ac^2 f^2 h m^2 x + 2 ac d e f h m^2 x - ac d f^2 h m x^2 - ac$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b*x+a)*(d*x+c)^(-4-m)*(f*x+e)^m*(h*x+g),x)

[Out] -(d*x+c)^(-3-m)*(f*x+e)^(1+m)*(-b*c^2*f^2*h*m^2*x^2+2*b*c*d*e*f*h*m^2*x^2-b*d^2*e^2*h*m^2*x^2-a*c^2*f^2*h*m^2*x+2*a*c*d*e*f*h*m^2*x-a*c*d*f^2*h*m*x^2-a*d^2*e^2*h*m^2*x+a*d^2*e*f*h*m*x^2-b*c^2*f^2*g*m^2*x-3*b*c^2*f^2*h*m*x^2+2*b*c*d*e*f*g*m^2*x+8*b*c*d*e*f*h*m*x^2-b*c*d*f^2*g*m*x^2-b*d^2*e^2*g*m^2*x-5*b*d^2*e^2*h*m*x^2+b*d^2*e*f*g*m*x^2-a*c^2*f^2*g*m^2-4*a*c^2*f^2*h*m*x+2*a*c*d*e*f*g*m^2+8*a*c*d*e*f*h*m*x-2*a*c*d*f^2*g*m*x-a*c*d*f^2*h*x^2-a*d^2*e^2*g*m^2-4*a*d^2*e^2*h*m*x+2*a*d^2*e*f*g*m*x+3*a*d^2*e*f*h*x^2-2*a*d^2*f^2*g*x^2+2*b*c^2*e*f*h*m*x-4*b*c^2*f^2*g*m*x-2*b*c^2*f^2*h*x^2-2*b*c*d*e^2*h*m*x+8*b*c*d*e*f*g*m*x+6*b*c*d*e*f*h*x^2-b*c*d*f^2*g*x^2-4*b*d^2*e^2*g*m*x-6*b*d^2*e^2*h*x^2+3*b*d^2*e*f*g*x^2+a*c^2*e*f*h*m-5*a*c^2*f^2*g*m-3*a*c^2*f^2*h*x-a*c*d*e^2*h*m+8*a*c*d*e*f*g*m+10*a*c*d*e*f*h*x-6*a*c*d*f^2*g*x-3*a*d^2*e^2*g*m-3*a*d^2*e^2*h*x+2*a*d^2*e*f*g*x+b*c^2*e*f*g*m+2*b*c^2*e*f*h*x-3*b*c^2*f^2*g*x-b*c*d*e^2*g*m-6*b*c*d*e^2*h*x+10*b*c*d*e*f*g*x-3*b*d^2*e^2*g*x+3*a*c^2*e*f*h-6*a*c^2*f^2*g-a*c*d*e^2*h+6*a*c*d*e*f*g-2*a*d^2*e^2*g-2*b*c^2*e^2*h+3*b*c^2*e*f*g-b*c*d*e^2*g)/(c^3*f^3*m^3-3*c^2*d*e*f^2*m^3+3*c*d^2*e^2*f*m^3-d^3*e^3*m^3+6*c^3*f^3*m^2-18*c^2*d*e*f^2*m^2+18*c*d^2*e^2*f*m^2-6*d^3*e^3*m^2+11*c^3*f^3*m-33*c^2*d*e*f^2*m+33*c*d^2*e^2*f*m-11*d^3*e^3*m+6*c^3*f^3-18*c^2*d*e*f^2+18*c*d^2*e^2*f-6*d^3*e^3)

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (bx + a)(hx + g)(dx + c)^{-m-4}(fx + e)^m dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b*x+a)*(d*x+c)^(-4-m)*(f*x+e)^m*(h*x+g),x, algorithm="maxima")

[Out] integrate((b*x + a)*(h*x + g)*(d*x + c)^(-m - 4)*(f*x + e)^m, x)

Fricas [B] time = 1.60383, size = 3272, normalized size = 9.01

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b*x+a)*(d*x+c)^(-4-m)*(f*x+e)^m*(h*x+g),x, algorithm="fricas")

[Out] -(((b*d^3*e^2*f - 2*b*c*d^2*e*f^2 + b*c^2*d*f^3)*h*m^2 - (3*b*d^3*e*f^2 - (b*c*d^2 + 2*a*d^3)*f^3)*g + (6*b*d^3*e^2*f - 3*(2*b*c*d^2 + a*d^3)*e*f^2 + (2*b*c^2*d + a*c*d^2)*f^3)*h - ((b*d^3*e*f^2 - b*c*d^2*f^3)*g - (5*b*d^3*e^2*f - (8*b*c*d^2 + a*d^3)*e*f^2 + (3*b*c^2*d + a*c*d^2)*f^3)*h)*m)*x^4 + (a*c*d^2*e^3 - 2*a*c^2*d*e^2*f + a*c^3*e*f^2)*g*m^2 + (((b*d^3*e^2*f - 2*b*c*d^2*e*f^2 + b*c^2*d*f^3)*g + (b*d^3*e^3 - (b*c*d^2 - a*d^3)*e^2*f - (b*c^2*d + 2*a*c*d^2)*e*f^2 + (b*c^3 + a*c^2*d)*f^3)*h)*m^2 - 4*(3*b*c*d^2*e*f^2 - (b*c^2*d + 2*a*c*d^2)*f^3)*g + 2*(3*b*d^3*e^3 + 3*b*c*d^2*e^2*f - 3*(b*c^2*d + 2*a*c*d^2)*e*f^2 + (b*c^3 + 2*a*c^2*d)*f^3)*h + (((3*b*d^3*e^2*f - 2*(4*b*c*d^2 + a*d^3)*e*f^2 + (5*b*c^2*d + 2*a*c*d^2)*f^3)*g + (5*b*d^3*e^3 - (b*c*d^2 - 3*a*d^3)*e^2*f - (7*b*c^2*d + 8*a*c*d^2)*e*f^2 + (3*b*c^3 + 5*a*c^2*d)*f^3)*h)*m)*x^3 + (((b*d^3*e^3 - (b*c*d^2 - a*d^3)*e^2*f - (b*c^2*d + 2*a*c*d^2)*e*f^2 + (b*c^3 + a*c^2*d)*f^3)*g + (a*c^3*f^3 + (b*c*d^2 + a*d^3)*e^3 - (2*b*c^2*d + a*c*d^2)*e^2*f + (b*c^3 - a*c^2*d)*e*f^2)*h)*m^2 + 3*(b*d^3*e^3 - 3*b*c*d^2*e^2*f - 3*b*c^2*d*e*f^2 + (b*c^3 + 4*a*c^2*d)*f^3)*g - 3*(3*a*c*d^2*e^2*f + 3*a*c^2*d*e*f^2 - a*c^3*f^3 - (4*b*c*d^2 + a*d^3)*e^3)*h + ((4*b*d^3*e^3 - (4*b*c*d^2 - a*d^3)*e^2*f - 4*(b*c^2*d + 2*a*c*d^2)*e*f^2 + (4*b*c^3 + 7*a*c^2*d)*f^3)*g + (4*a*c^3*f^3 + (7*b*c*d^2 + 4*a*d^3)*e^3 - 4*(2*b*c^2*d + a*c*d^2)*e^2*f + (b*c^3 - 4*a*c^2*d)*e*f^2)*h)*m)*x^2 + (6*a*c^3*e*f^2 + (b*c^2*d + 2*a*c*d^2)*e^3 - 3*(b*c^3 + 2*a*c^2*d)*e^2*f)*g - (3*a*c^3*e^2*f - (2*b*c^3 + a*c^2*d)*e^3)*h + ((5*a*c^3*e*f^2 + (b*c^2*d + 3*a*c*d^2)*e^3 - (b*c^3 + 8*a*c^2*d)*e^2*f)*g + (a*c^2*d*e^3 - a*c^3*e^2*f)*h)*m + (((a*c^3*f^3 + (b*c*d^2 + a*d^3)*e^3 - (2*b*c^2*d + a*c*d^2)*

$$\begin{aligned}
& e^{2f} + (b^3c - a^2cd)ef^2g + (acd^2e^3 - 2a^2c^2de^{2f} + a^3c^3 \\
& *ef^2)h)m^2 + 2*(3a^2c^2d^2ef^2 + 3a^3c^3f^3 + (2b^2cd^2 + a^2d^3)e^3 \\
& - 3*(2b^2c^2d + a^2cd^2)ef^2)g - 4*(3a^2c^2d^2e^{2f} - (2b^2c^2d + a^2c \\
& *d^2)e^3)h + ((5a^2c^3f^3 + (5b^2cd^2 + 3a^2d^3)e^3 - (8b^2c^2d + 7a \\
& *cd^2)ef^2 + (3b^2c^3 - a^2cd)ef^2)g + (3a^2c^3ef^2 + (2b^2c^2d \\
& + 5a^2cd^2)e^3 - 2*(b^2c^3 + 4a^2c^2d)ef^2)h)m)x*(dx + c)^{-m-4} \\
& *(fx + e)^m / (6d^3e^3 - 18c^2d^2e^{2f} + 18c^2d^2ef^2 - 6c^3f^3 + (d^3 \\
& *e^3 - 3c^2d^2e^{2f} + 3c^2d^2ef^2 - c^3f^3)m^3 + 6*(d^3e^3 - 3c^2d^2 \\
& *e^{2f} + 3c^2d^2ef^2 - c^3f^3)m^2 + 11*(d^3e^3 - 3c^2d^2e^{2f} + 3c^2 \\
& *d^2ef^2 - c^3f^3)m)
\end{aligned}$$

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b*x+a)*(d*x+c)**(-4-m)*(f*x+e)**m*(h*x+g),x)

[Out] Timed out

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (bx + a)(hx + g)(dx + c)^{-m-4}(fx + e)^m dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b*x+a)*(d*x+c)^(-4-m)*(f*x+e)^m*(h*x+g),x, algorithm="giac")

[Out] integrate((b*x + a)*(h*x + g)*(d*x + c)^(-m - 4)*(f*x + e)^m, x)

3.135 $\int (c + dx)^{-4-m} (e + fx)^m (g + hx) dx$

Optimal. Leaf size=188

$$\frac{(dg - ch)(c + dx)^{-m-3}(e + fx)^{m+1}}{d(m+3)(de - cf)} + \frac{(c + dx)^{-m-2}(e + fx)^{m+1}(cfh(m+1) + d(2fg - eh(m+3)))}{d(m+2)(m+3)(de - cf)^2} - \frac{f(c + dx)^{-m-1}(e + fx)^m}{d(m+3)}$$

```
[Out] -(((d*g - c*h)*(c + d*x)^(-3 - m)*(e + f*x)^(1 + m))/(d*(d*e - c*f)*(3 + m))
+ (((c*f*h*(1 + m) + d*(2*f*g - e*h*(3 + m)))*(c + d*x)^(-2 - m)*(e + f*x)
)^(1 + m))/(d*(d*e - c*f)^2*(2 + m)*(3 + m)) - (f*(c*f*h*(1 + m) + d*(2*f*g
- e*h*(3 + m)))*(c + d*x)^(-1 - m)*(e + f*x)^(1 + m))/(d*(d*e - c*f)^3*(1
+ m)*(2 + m)*(3 + m))
```

Rubi [A] time = 0.0982305, antiderivative size = 186, normalized size of antiderivative = 0.99, number of steps used = 3, number of rules used = 3, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.125$, Rules used = {79, 45, 37}

$$\frac{(dg - ch)(c + dx)^{-m-3}(e + fx)^{m+1}}{d(m+3)(de - cf)} + \frac{(c + dx)^{-m-2}(e + fx)^{m+1}(cfh(m+1) - deh(m+3) + 2dfg)}{d(m+2)(m+3)(de - cf)^2} - \frac{f(c + dx)^{-m-1}(e + fx)^m}{d(m+3)}$$

Antiderivative was successfully verified.

```
[In] Int[(c + d*x)^(-4 - m)*(e + f*x)^m*(g + h*x), x]
```

```
[Out] -(((d*g - c*h)*(c + d*x)^(-3 - m)*(e + f*x)^(1 + m))/(d*(d*e - c*f)*(3 + m))
+ ((2*d*f*g + c*f*h*(1 + m) - d*e*h*(3 + m))*(c + d*x)^(-2 - m)*(e + f*x)
)^(1 + m))/(d*(d*e - c*f)^2*(2 + m)*(3 + m)) - (f*(2*d*f*g + c*f*h*(1 + m)
- d*e*h*(3 + m))*(c + d*x)^(-1 - m)*(e + f*x)^(1 + m))/(d*(d*e - c*f)^3*(1
+ m)*(2 + m)*(3 + m))
```

Rule 79

```
Int[((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p
_.), x_Symbol] := -Simp[((b*e - a*f)*(c + d*x)^(n + 1)*(e + f*x)^(p + 1))/(
f*(p + 1)*(c*f - d*e)), x] - Dist[(a*d*f*(n + p + 2) - b*(d*e*(n + 1) + c*f
*(p + 1)))/(f*(p + 1)*(c*f - d*e)), Int[(c + d*x)^n*(e + f*x)^Simplify[p +
1], x], x] /; FreeQ[{a, b, c, d, e, f, n, p}, x] && !RationalQ[p] && SumSi
mplerQ[p, 1]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*S
```

```

simplify[m + n + 2])/((b*c - a*d)*(m + 1)), Int[(a + b*x)^Simplify[m + 1]*(c
+ d*x)^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && I
LtQ[Simplify[m + n + 2], 0] && NeQ[m, -1] && !(LtQ[m, -1] && LtQ[n, -1] &&
(EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && (SumSimpler
Q[m, 1] || !SumSimplerQ[n, 1])

```

Rule 37

```

Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] := Simp
[((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] /; FreeQ[{
a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && EqQ[m + n + 2, 0] && NeQ[m, -
1]

```

Rubi steps

$$\begin{aligned}
\int (c + dx)^{-4-m}(e + fx)^m(g + hx) dx &= -\frac{(dg - ch)(c + dx)^{-3-m}(e + fx)^{1+m}}{d(de - cf)(3 + m)} - \frac{(2dfg + cfh(1 + m) - deh(3 + m)) \int (c + dx)^{-4-m}(e + fx)^m dx}{d(de - cf)(3 + m)} \\
&= -\frac{(dg - ch)(c + dx)^{-3-m}(e + fx)^{1+m}}{d(de - cf)(3 + m)} + \frac{(2dfg + cfh(1 + m) - deh(3 + m))(c + dx)^{-3-m}}{d(de - cf)^2(2 + m)(3 + m)} \\
&= -\frac{(dg - ch)(c + dx)^{-3-m}(e + fx)^{1+m}}{d(de - cf)(3 + m)} + \frac{(2dfg + cfh(1 + m) - deh(3 + m))(c + dx)^{-3-m}}{d(de - cf)^2(2 + m)(3 + m)}
\end{aligned}$$

Mathematica [A] time = 0.119008, size = 182, normalized size = 0.97

$$\frac{(ch - dg)(c + dx)^{-m-3}(e + fx)^{m+1}}{d(-m - 3)(de - cf)} - \frac{\left(\frac{(c+dx)^{-m-2}(e+fx)^{m+1}}{(-m-2)(de-cf)} + \frac{f(c+dx)^{-m-1}(e+fx)^{m+1}}{(-m-2)(-m-1)(de-cf)^2}\right)(-h(cf(m+1) + de(-m-3)) - 2dfg)}{d(-m - 3)(de - cf)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c + d*x)^(-4 - m)*(e + f*x)^m*(g + h*x), x]
```

```
[Out] -((((d*g) + c*h)*(c + d*x)^(-3 - m)*(e + f*x)^(1 + m))/(d*(d*e - c*f)*(-3
- m))) - ((-2*d*f*g - h*(d*e*(-3 - m) + c*f*(1 + m)))*(((c + d*x)^(-2 - m)*
(e + f*x)^(1 + m))/((d*e - c*f)*(-2 - m)) + (f*(c + d*x)^(-1 - m)*(e + f*x)
^(1 + m))/((d*e - c*f)^2*(-2 - m)*(-1 - m))))/(d*(d*e - c*f)*(-3 - m))

```

Maple [B] time = 0.008, size = 509, normalized size = 2.7

$$\frac{(dx + c)^{-3-m} (fx + e)^{1+m} (-c^2 f^2 h m^2 x + 2 c d e f h m^2 x - c d f^2 h m x^2 - d^2 e^2 h m^2 x + d^2 e f h m x^2 - c^2 f^2 g m^2 - 4 c^2 f^2 h m x + c^3 f^3 m^3 - 3 c^2 d e f)}{c^3 f^3 m^3 - 3 c^2 d e f}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `int((d*x+c)^(-4-m)*(f*x+e)^m*(h*x+g),x)`

[Out] $-(d*x+c)^{-3-m}*(f*x+e)^{(1+m)}*(-c^2*f^2*h*m^2*x+2*c*d*e*f*h*m^2*x-c*d*f^2*h*m*x^2-d^2*e^2*h*m^2*x+d^2*e*f*h*m*x^2-c^2*f^2*g*m^2-4*c^2*f^2*h*m*x+2*c*d*e*f*g*m^2+8*c*d*e*f*h*m*x-2*c*d*f^2*g*m*x-c*d*f^2*h*x^2-d^2*e^2*g*m^2-4*d^2*e^2*h*m*x+2*d^2*e*f*g*m*x+3*d^2*e*f*h*x^2-2*d^2*f^2*g*x^2+c^2*e*f*h*m-5*c^2*f^2*g*m-3*c^2*f^2*h*x-c*d*e^2*h*m+8*c*d*e*f*g*m+10*c*d*e*f*h*x-6*c*d*f^2*g*x-3*d^2*e^2*g*m-3*d^2*e^2*h*x+2*d^2*e*f*g*x+3*c^2*e*f*h-6*c^2*f^2*g-c*d*e^2*h+6*c*d*e*f*g-2*d^2*e^2*g)/(c^3*f^3*m^3-3*c^2*d*e*f^2*m^3+3*c*d^2*e^2*f*m^3-d^3*e^3*m^3+6*c^3*f^3*m^2-18*c^2*d*e*f^2*m^2+18*c*d^2*e^2*f*m^2-6*d^3*e^3*m^2+11*c^3*f^3*m-33*c^2*d*e*f^2*m+33*c*d^2*e^2*f*m-11*d^3*e^3*m+6*c^3*f^3-18*c^2*d*e*f^2+18*c*d^2*e^2*f-6*d^3*e^3)$

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (hx + g)(dx + c)^{-m-4}(fx + e)^m dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((d*x+c)^(-4-m)*(f*x+e)^m*(h*x+g),x, algorithm="maxima")`

[Out] `integrate((h*x + g)*(d*x + c)^(-m - 4)*(f*x + e)^m, x)`

Fricas [B] time = 1.50452, size = 1805, normalized size = 9.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((d*x+c)^(-4-m)*(f*x+e)^m*(h*x+g),x, algorithm="fricas")`

```
[Out] -((2*d^3*f^3*g - (d^3*e*f^2 - c*d^2*f^3)*h*m - (3*d^3*e*f^2 - c*d^2*f^3)*h)
*x^4 + (c*d^2*e^3 - 2*c^2*d*e^2*f + c^3*e*f^2)*g*m^2 + (8*c*d^2*f^3*g + (d^
3*e^2*f - 2*c*d^2*e*f^2 + c^2*d*f^3)*h*m^2 - 4*(3*c*d^2*e*f^2 - c^2*d*f^3)*
h - (2*(d^3*e*f^2 - c*d^2*f^3)*g - (3*d^3*e^2*f - 8*c*d^2*e*f^2 + 5*c^2*d*f
^3)*h)*m)*x^3 + (12*c^2*d*f^3*g + ((d^3*e^2*f - 2*c*d^2*e*f^2 + c^2*d*f^3)*
g + (d^3*e^3 - c*d^2*e^2*f - c^2*d*e*f^2 + c^3*f^3)*h)*m^2 + 3*(d^3*e^3 - 3
*c*d^2*e^2*f - 3*c^2*d*e*f^2 + c^3*f^3)*h + ((d^3*e^2*f - 8*c*d^2*e*f^2 + 7
*c^2*d*f^3)*g + 4*(d^3*e^3 - c*d^2*e^2*f - c^2*d*e*f^2 + c^3*f^3)*h)*m)*x^2
+ 2*(c*d^2*e^3 - 3*c^2*d*e^2*f + 3*c^3*e*f^2)*g + (c^2*d*e^3 - 3*c^3*e^2*f
)*h + ((3*c*d^2*e^3 - 8*c^2*d*e^2*f + 5*c^3*e*f^2)*g + (c^2*d*e^3 - c^3*e^2
*f)*h)*m + (((d^3*e^3 - c*d^2*e^2*f - c^2*d*e*f^2 + c^3*f^3)*g + (c*d^2*e^3
- 2*c^2*d*e^2*f + c^3*e*f^2)*h)*m^2 + 2*(d^3*e^3 - 3*c*d^2*e^2*f + 3*c^2*d
*e*f^2 + 3*c^3*f^3)*g + 4*(c*d^2*e^3 - 3*c^2*d*e^2*f)*h + ((3*d^3*e^3 - 7*c
*d^2*e^2*f - c^2*d*e*f^2 + 5*c^3*f^3)*g + (5*c*d^2*e^3 - 8*c^2*d*e^2*f + 3*
c^3*e*f^2)*h)*m)*x*(d*x + c)^(-m - 4)*(f*x + e)^m/(6*d^3*e^3 - 18*c*d^2*e^
2*f + 18*c^2*d*e*f^2 - 6*c^3*f^3 + (d^3*e^3 - 3*c*d^2*e^2*f + 3*c^2*d*e*f^2
- c^3*f^3)*m^3 + 6*(d^3*e^3 - 3*c*d^2*e^2*f + 3*c^2*d*e*f^2 - c^3*f^3)*m^2
+ 11*(d^3*e^3 - 3*c*d^2*e^2*f + 3*c^2*d*e*f^2 - c^3*f^3)*m)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*x+c)**(-4-m)*(f*x+e)**m*(h*x+g),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (hx + g)(dx + c)^{-m-4}(fx + e)^m dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*x+c)^(-4-m)*(f*x+e)^m*(h*x+g),x, algorithm="giac")
```

```
[Out] integrate((h*x + g)*(d*x + c)^(-m - 4)*(f*x + e)^m, x)
```

$$3.136 \quad \int \frac{(A+Bx)(c+dx)^n(e+fx)^p}{a+bx} dx$$

Optimal. Leaf size=177

$$\frac{(Ab - aB)(c + dx)^{n+1}(e + fx)^p \left(\frac{d(e+fx)}{de-cf}\right)^{-p} F_1\left(n + 1; 1, -p; n + 2; \frac{b(c+dx)}{bc-ad}, -\frac{f(c+dx)}{de-cf}\right)}{b(n+1)(bc - ad)} - \frac{B(c + dx)^{n+1}(e + fx)^{p+1} {}_2F_1\left(1, n\right)}{b(p+1)(de - c)}$$

[Out] -(((A*b - a*B)*(c + d*x)^(1 + n)*(e + f*x)^p*AppellF1[1 + n, 1, -p, 2 + n, (b*(c + d*x))/(b*c - a*d), -(f*(c + d*x))/(d*e - c*f)])/(b*(b*c - a*d)*(1 + n)*((d*(e + f*x))/(d*e - c*f))^p) - (B*(c + d*x)^(1 + n)*(e + f*x)^(1 + p)*Hypergeometric2F1[1, 2 + n + p, 2 + p, (d*(e + f*x))/(d*e - c*f)]/(b*(d*e - c*f)*(1 + p)))

Rubi [A] time = 0.118519, antiderivative size = 190, normalized size of antiderivative = 1.07, number of steps used = 5, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.185$, Rules used = {157, 70, 69, 137, 136}

$$\frac{B(c + dx)^{n+1}(e + fx)^p \left(\frac{d(e+fx)}{de-cf}\right)^{-p} {}_2F_1\left(n + 1, -p; n + 2; -\frac{f(c+dx)}{de-cf}\right)}{bd(n+1)} - \frac{(Ab - aB)(c + dx)^{n+1}(e + fx)^p \left(\frac{d(e+fx)}{de-cf}\right)^{-p} F_1\left(n + 1, -p; n + 2; \frac{b(c+dx)}{bc-ad}, -\frac{f(c+dx)}{de-cf}\right)}{b(n+1)(bc - ad)}$$

Warning: Unable to verify antiderivative.

[In] Int[((A + B*x)*(c + d*x)^n*(e + f*x)^p)/(a + b*x), x]

[Out] -(((A*b - a*B)*(c + d*x)^(1 + n)*(e + f*x)^p*AppellF1[1 + n, -p, 1, 2 + n, -(f*(c + d*x))/(d*e - c*f), (b*(c + d*x))/(b*c - a*d)])/(b*(b*c - a*d)*(1 + n)*((d*(e + f*x))/(d*e - c*f))^p) + (B*(c + d*x)^(1 + n)*(e + f*x)^p*Hypergeometric2F1[1 + n, -p, 2 + n, -(f*(c + d*x))/(d*e - c*f)]/(b*d*(1 + n)*((d*(e + f*x))/(d*e - c*f))^p))

Rule 157

Int[(((c_.) + (d_.)*(x_))^(n_)*((e_.) + (f_.)*(x_))^(p_)*((g_.) + (h_.)*(x_))) / ((a_.) + (b_.)*(x_)), x_Symbol] := Dist[h/b, Int[(c + d*x)^n*(e + f*x)^p, x], x] + Dist[(b*g - a*h)/b, Int[((c + d*x)^n*(e + f*x)^p)/(a + b*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, h, n, p}, x]

Rule 70

Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] := Dist[(c + d*x)^FracPart[n] / ((b/(b*c - a*d))^IntPart[n]*((b*(c + d*x))/(b*c - a*d))

```

^FracPart[n]), Int[(a + b*x)^m*Simp[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)
, x]^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && !In
tegerQ[m] && !IntegerQ[n] && (RationalQ[m] || !SimplerQ[n + 1, m + 1])

```

Rule 69

```

Int[((a_) + (b_)*(x_))^(m_)*((c_) + (d_)*(x_))^(n_), x_Symbol] := Simp[((
a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a + b*x))/(b*c -
a*d))]/(b*(m + 1)*(b/(b*c - a*d))^n), x] /; FreeQ[{a, b, c, d, m, n}, x]
&& NeQ[b*c - a*d, 0] && !IntegerQ[m] && !IntegerQ[n] && GtQ[b/(b*c - a*d)
, 0] && (RationalQ[m] || !(RationalQ[n] && GtQ[-(d/(b*c - a*d)), 0]))

```

Rule 137

```

Int[((a_) + (b_)*(x_))^(m_)*((c_) + (d_)*(x_))^(n_)*((e_) + (f_)*(x_))
^(p_), x_Symbol] := Dist[(c + d*x)^FracPart[n]/(b/(b*c - a*d))^IntPart[n]*
((b*(c + d*x))/(b*c - a*d))^FracPart[n]), Int[(a + b*x)^m*((b*c)/(b*c - a*d)
) + (b*d*x)/(b*c - a*d)^n*(e + f*x)^p, x], x] /; FreeQ[{a, b, c, d, e, f,
m, n}, x] && !IntegerQ[m] && !IntegerQ[n] && IntegerQ[p] && !GtQ[b/(b*c
- a*d), 0] && !SimplerQ[c + d*x, a + b*x]

```

Rule 136

```

Int[((a_) + (b_)*(x_))^(m_)*((c_) + (d_)*(x_))^(n_)*((e_) + (f_)*(x_))
^(p_), x_Symbol] := Simp[((b*e - a*f)^p*(a + b*x)^(m + 1)*AppellF1[m + 1, -
n, -p, m + 2, -((d*(a + b*x))/(b*c - a*d)), -((f*(a + b*x))/(b*e - a*f))]/
(b^(p + 1)*(m + 1)*(b/(b*c - a*d))^n), x] /; FreeQ[{a, b, c, d, e, f, m, n}
, x] && !IntegerQ[m] && !IntegerQ[n] && IntegerQ[p] && GtQ[b/(b*c - a*d),
0] && !(GtQ[d/(d*a - c*b), 0] && SimplerQ[c + d*x, a + b*x])

```

Rubi steps

$$\begin{aligned}
\int \frac{(A + Bx)(c + dx)^n(e + fx)^p}{a + bx} dx &= \frac{B \int (c + dx)^n(e + fx)^p dx}{b} + \frac{(Ab - aB) \int \frac{(c + dx)^n(e + fx)^p}{a + bx} dx}{b} \\
&= \frac{\left(B(e + fx)^p \left(\frac{d(e + fx)}{de - cf} \right)^{-p} \right) \int (c + dx)^n \left(\frac{de}{de - cf} + \frac{dfx}{de - cf} \right)^p dx}{b} + \frac{\left((Ab - aB)(e + fx)^p \left(\frac{d(e + fx)}{de - cf} \right)^{-p} \right) \int (c + dx)^n dx}{b} \\
&= \frac{(Ab - aB)(c + dx)^{1+n}(e + fx)^p \left(\frac{d(e + fx)}{de - cf} \right)^{-p} F_1 \left(1 + n; -p, 1; 2 + n; -\frac{f(c + dx)}{de - cf}, \frac{b(c + dx)}{bc - ad} \right)}{b(bc - ad)(1 + n)}
\end{aligned}$$

Mathematica [A] time = 0.398779, size = 199, normalized size = 1.12

$$\frac{(c + dx)^n (e + fx)^p \left(\frac{(Ab - aB) \left(\frac{b(c+dx)}{d(a+bx)} \right)^{-n} \left(\frac{b(e+fx)}{f(a+bx)} \right)^{-p} F_1 \left(-n-p; -n, -p; -n-p+1; \frac{ad-bc}{d(a+bx)}, \frac{af-be}{f(a+bx)} \right)}{n+p} + \frac{bB(e+fx) \left(\frac{f(c+dx)}{cf-de} \right)^{-n} {}_2F_1 \left(-n, p+1; p+2; \frac{d(e+fx)}{de-cf} \right)}{f(p+1)} \right)}{b^2}$$

Warning: Unable to verify antiderivative.

[In] Integrate[((A + B*x)*(c + d*x)^n*(e + f*x)^p)/(a + b*x), x]

[Out] ((c + d*x)^n*(e + f*x)^p*((A*b - a*B)*AppellF1[-n - p, -n, -p, 1 - n - p, (-b*c) + a*d)/(d*(a + b*x)), (-b*e) + a*f)/(f*(a + b*x))]/((n + p)*((b*(c + d*x))/(d*(a + b*x)))^n*((b*(e + f*x))/(f*(a + b*x)))^p) + (b*B*(e + f*x)*Hypergeometric2F1[-n, 1 + p, 2 + p, (d*(e + f*x))/(d*e - c*f)]/(f*(1 + p))*((f*(c + d*x))/(-d*e + c*f))^n))/b^2

Maple [F] time = 0.071, size = 0, normalized size = 0.

$$\int \frac{(fx + e)^p (dx + c)^n (Bx + A)}{bx + a} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((B*x+A)*(d*x+c)^n*(f*x+e)^p/(b*x+a), x)

[Out] int((B*x+A)*(d*x+c)^n*(f*x+e)^p/(b*x+a), x)

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(Bx + A)(dx + c)^n (fx + e)^p}{bx + a} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((B*x+A)*(d*x+c)^n*(f*x+e)^p/(b*x+a), x, algorithm="maxima")

[Out] integrate((B*x + A)*(d*x + c)^n*(f*x + e)^p/(b*x + a), x)

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{(Bx + A)(dx + c)^n (fx + e)^p}{bx + a}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((B*x+A)*(d*x+c)^n*(f*x+e)^p/(b*x+a),x, algorithm="fricas")`

[Out] `integral((B*x + A)*(d*x + c)^n*(f*x + e)^p/(b*x + a), x)`

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((B*x+A)*(d*x+c)**n*(f*x+e)**p/(b*x+a),x)`

[Out] Timed out

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(Bx + A)(dx + c)^n (fx + e)^p}{bx + a} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((B*x+A)*(d*x+c)^n*(f*x+e)^p/(b*x+a),x, algorithm="giac")`

[Out] `integrate((B*x + A)*(d*x + c)^n*(f*x + e)^p/(b*x + a), x)`

$$3.137 \quad \int \frac{(a+bx)^m(A+Bx)(c+dx)^{-m}}{e+fx} dx$$

Optimal. Leaf size=233

$$\frac{(a+bx)^m(Be-Af)(c+dx)^{-m} {}_2F_1\left(1, -m; 1-m; \frac{(be-af)(c+dx)}{(de-cf)(a+bx)}\right)}{f^{2m}} - \frac{(a+bx)^{m+1}(c+dx)^{-m} \left(\frac{b(c+dx)}{bc-ad}\right)^m {}_2F_1\left(m, m+1; m+1; \frac{b(c+dx)}{bc-ad}\right)}{bf^{2m}(m+1)}$$

```
[Out] -((d*(B*e - A*f)*(a + b*x)^(1 + m))/((b*c - a*d)*f^2*m*(c + d*x)^m)) - ((B*
e - A*f)*(a + b*x)^m*Hypergeometric2F1[1, -m, 1 - m, ((b*e - a*f)*(c + d*x)
)/((d*e - c*f)*(a + b*x))])/(f^2*m*(c + d*x)^m) - ((a*B*d*f*m - b*(B*d*e -
A*d*f + B*c*f*m))*(a + b*x)^(1 + m)*((b*(c + d*x))/(b*c - a*d))^m*Hypergeom
etric2F1[m, 1 + m, 2 + m, -((d*(a + b*x))/(b*c - a*d))])/(b*(b*c - a*d)*f^2
*m*(1 + m)*(c + d*x)^m)
```

Rubi [A] time = 0.12704, antiderivative size = 220, normalized size of antiderivative = 0.94, number of steps used = 7, number of rules used = 5, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.172$, Rules used = {157, 70, 69, 105, 131}

$$\frac{(a+bx)^m(Be-Af)(c+dx)^{-m} {}_2F_1\left(1, m; m+1; \frac{(de-cf)(a+bx)}{(be-af)(c+dx)}\right)}{f^{2m}} - \frac{(a+bx)^m(Be-Af)(c+dx)^{-m} \left(\frac{b(c+dx)}{bc-ad}\right)^m {}_2F_1\left(m, m; m+1; \frac{b(c+dx)}{bc-ad}\right)}{f^{2m}}$$

Antiderivative was successfully verified.

```
[In] Int[((a + b*x)^m*(A + B*x))/((c + d*x)^m*(e + f*x)), x]
```

```
[Out] ((B*e - A*f)*(a + b*x)^m*Hypergeometric2F1[1, m, 1 + m, ((d*e - c*f)*(a + b
*x))/((b*e - a*f)*(c + d*x))])/(f^2*m*(c + d*x)^m) - ((B*e - A*f)*(a + b*x)
^m*((b*(c + d*x))/(b*c - a*d))^m*Hypergeometric2F1[m, m, 1 + m, -((d*(a + b
*x))/(b*c - a*d))])/(f^2*m*(c + d*x)^m) + (B*(a + b*x)^(1 + m)*((b*(c + d*x)
))/(b*c - a*d))^m*Hypergeometric2F1[m, 1 + m, 2 + m, -((d*(a + b*x))/(b*c -
a*d))])/(b*f*(1 + m)*(c + d*x)^m)
```

Rule 157

```
Int[(((c_.) + (d_.)*(x_))^(n_)*((e_.) + (f_.)*(x_))^(p_)*((g_.) + (h_.)*(x_
)))/((a_.) + (b_.)*(x_)), x_Symbol] := Dist[h/b, Int[(c + d*x)^n*(e + f*x)^
p, x], x] + Dist[(b*g - a*h)/b, Int[((c + d*x)^n*(e + f*x)^p)/(a + b*x), x]
, x] /; FreeQ[{a, b, c, d, e, f, g, h, n, p}, x]
```

Rule 70

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] := Dist[(c
+ d*x)^FracPart[n]/((b/(b*c - a*d))^IntPart[n]*((b*(c + d*x))/(b*c - a*d))
^FracPart[n]), Int[(a + b*x)^m*Simp[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)
, x]^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && !In
tegerQ[m] && !IntegerQ[n] && (RationalQ[m] || !SimplerQ[n + 1, m + 1])
```

Rule 69

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] := Simp[((
a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a + b*x))/(b*c -
a*d))]/(b*(m + 1)*(b/(b*c - a*d))^n), x] /; FreeQ[{a, b, c, d, m, n}, x]
&& NeQ[b*c - a*d, 0] && !IntegerQ[m] && !IntegerQ[n] && GtQ[b/(b*c - a*d)
, 0] && (RationalQ[m] || !(RationalQ[n] && GtQ[-(d/(b*c - a*d)), 0]))
```

Rule 105

```
Int[(((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x
_)), x_Symbol] := Dist[b/f, Int[(a + b*x)^(m - 1)*(c + d*x)^n, x], x] - Dis
t[(b*e - a*f)/f, Int[((a + b*x)^(m - 1)*(c + d*x)^n)/(e + f*x), x], x] /; F
reeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[Simplify[m + n + 1], 0] && (GtQ[m
, 0] || (!RationalQ[m] && (SumSimplerQ[m, -1] || !SumSimplerQ[n, -1])))
```

Rule 131

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_)*((e_.) + (f_.)*(x_
))^p_, x_Symbol] := Simp[((b*c - a*d)^n*(a + b*x)^(m + 1)*Hypergeometric2
F1[m + 1, -n, m + 2, -((d*e - c*f)*(a + b*x))/((b*c - a*d)*(e + f*x))]/(
(m + 1)*(b*e - a*f)^(n + 1)*(e + f*x)^(m + 1)), x] /; FreeQ[{a, b, c, d, e,
f, m, p}, x] && EqQ[m + n + p + 2, 0] && ILtQ[n, 0]
```

Rubi steps

$$\begin{aligned}
\int \frac{(a+bx)^m(A+Bx)(c+dx)^{-m}}{e+fx} dx &= \frac{B \int (a+bx)^m(c+dx)^{-m} dx}{f} + \frac{(-Be+Af) \int \frac{(a+bx)^m(c+dx)^{-m}}{e+fx} dx}{f} \\
&= -\frac{(b(Be-Af)) \int (a+bx)^{-1+m}(c+dx)^{-m} dx}{f^2} + \frac{((be-af)(Be-Af)) \int \frac{(a+bx)^{-1+m}(c+dx)^{-m}}{e+fx} dx}{f^2} \\
&= \frac{(Be-Af)(a+bx)^m(c+dx)^{-m} {}_2F_1\left(1, m; 1+m; \frac{(de-cf)(a+bx)}{(be-af)(c+dx)}\right)}{f^2 m} + \frac{B(a+bx)^{1+m}(c+dx)^{-m}}{f^2} \\
&= \frac{(Be-Af)(a+bx)^m(c+dx)^{-m} {}_2F_1\left(1, m; 1+m; \frac{(de-cf)(a+bx)}{(be-af)(c+dx)}\right)}{f^2 m} - \frac{(Be-Af)(a+bx)^{1+m}(c+dx)^{-m}}{f^2}
\end{aligned}$$

Mathematica [A] time = 0.136575, size = 174, normalized size = 0.75

$$\frac{(a+bx)^m(c+dx)^{-m} \left(\left(\frac{b(c+dx)}{bc-ad} \right)^m \left(B f m (a+bx) {}_2F_1\left(m, m+1; m+2; \frac{d(a+bx)}{ad-bc}\right) - b(m+1)(Be-Af) {}_2F_1\left(m, m; m+1; \frac{d(a+bx)}{ad-bc}\right) \right) \right)}{b f^2 m (m+1)}$$

Antiderivative was successfully verified.

[In] Integrate[((a + b*x)^m*(A + B*x))/((c + d*x)^m*(e + f*x)), x]

[Out] ((a + b*x)^m*(b*(B*e - A*f)*(1 + m)*Hypergeometric2F1[1, m, 1 + m, ((d*e - c*f)*(a + b*x))/((b*e - a*f)*(c + d*x))]) + ((b*(c + d*x))/(b*c - a*d))^m*(-(b*(B*e - A*f)*(1 + m)*Hypergeometric2F1[m, m, 1 + m, (d*(a + b*x))/(-(b*c) + a*d)]) + B*f*m*(a + b*x)*Hypergeometric2F1[m, 1 + m, 2 + m, (d*(a + b*x))/(-(b*c) + a*d)])))/(b*f^2*m*(1 + m)*(c + d*x)^m)

Maple [F] time = 0.068, size = 0, normalized size = 0.

$$\int \frac{(Bx+A)(bx+a)^m}{(dx+c)^m(fx+e)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b*x+a)^m*(B*x+A)/((d*x+c)^m)/(f*x+e), x)

[Out] `int((b*x+a)^m*(B*x+A)/((d*x+c)^m)/(f*x+e),x)`

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(Bx + A)(bx + a)^m}{(fx + e)(dx + c)^m} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((b*x+a)^m*(B*x+A)/((d*x+c)^m)/(f*x+e),x, algorithm="maxima")`

[Out] `integrate((B*x + A)*(b*x + a)^m/((f*x + e)*(d*x + c)^m), x)`

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{(Bx + A)(bx + a)^m}{(fx + e)(dx + c)^m}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((b*x+a)^m*(B*x+A)/((d*x+c)^m)/(f*x+e),x, algorithm="fricas")`

[Out] `integral((B*x + A)*(b*x + a)^m/((f*x + e)*(d*x + c)^m), x)`

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((b*x+a)**m*(B*x+A)/((d*x+c)**m)/(f*x+e),x)`

[Out] Timed out

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(Bx + A)(bx + a)^m}{(fx + e)(dx + c)^m} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b*x+a)^m*(B*x+A)/((d*x+c)^m)/(f*x+e),x, algorithm="giac")

[Out] integrate((B*x + A)*(b*x + a)^m/((f*x + e)*(d*x + c)^m), x)

$$3.138 \quad \int \frac{(A+Bx)(c+dx)^n(e+fx)^p}{\sqrt{a+bx}} dx$$

Optimal. Leaf size=250

$$\frac{2\sqrt{a+bx}(Ab-aB)(c+dx)^n(e+fx)^p \left(\frac{b(c+dx)}{bc-ad}\right)^{-n} \left(\frac{b(e+fx)}{be-af}\right)^{-p} F_1\left(\frac{1}{2}; -n, -p; \frac{3}{2}; -\frac{d(a+bx)}{bc-ad}, -\frac{f(a+bx)}{be-af}\right)}{b^2} + \frac{2B(a+bx)^{3/2}(c+dx)^n}{b^2}$$

[Out] (2*(A*b - a*B)*Sqrt[a + b*x]*(c + d*x)^n*(e + f*x)^p*AppellF1[1/2, -n, -p, 3/2, -((d*(a + b*x))/(b*c - a*d)), -(f*(a + b*x))/(b*e - a*f)])/b^2*((b*(c + d*x))/(b*c - a*d))^n*((b*(e + f*x))/(b*e - a*f))^p + (2*B*(a + b*x)^(3/2)*(c + d*x)^n*(e + f*x)^p*AppellF1[3/2, -n, -p, 5/2, -((d*(a + b*x))/(b*c - a*d)), -(f*(a + b*x))/(b*e - a*f)])/((3*b^2*((b*(c + d*x))/(b*c - a*d))^n*((b*(e + f*x))/(b*e - a*f))^p)

Rubi [A] time = 0.217165, antiderivative size = 250, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 4, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.138$, Rules used = {159, 140, 139, 138}

$$\frac{2\sqrt{a+bx}(Ab-aB)(c+dx)^n(e+fx)^p \left(\frac{b(c+dx)}{bc-ad}\right)^{-n} \left(\frac{b(e+fx)}{be-af}\right)^{-p} F_1\left(\frac{1}{2}; -n, -p; \frac{3}{2}; -\frac{d(a+bx)}{bc-ad}, -\frac{f(a+bx)}{be-af}\right)}{b^2} + \frac{2B(a+bx)^{3/2}(c+dx)^n}{b^2}$$

Antiderivative was successfully verified.

[In] Int[((A + B*x)*(c + d*x)^n*(e + f*x)^p)/Sqrt[a + b*x], x]

[Out] (2*(A*b - a*B)*Sqrt[a + b*x]*(c + d*x)^n*(e + f*x)^p*AppellF1[1/2, -n, -p, 3/2, -((d*(a + b*x))/(b*c - a*d)), -(f*(a + b*x))/(b*e - a*f)])/b^2*((b*(c + d*x))/(b*c - a*d))^n*((b*(e + f*x))/(b*e - a*f))^p + (2*B*(a + b*x)^(3/2)*(c + d*x)^n*(e + f*x)^p*AppellF1[3/2, -n, -p, 5/2, -((d*(a + b*x))/(b*c - a*d)), -(f*(a + b*x))/(b*e - a*f)])/((3*b^2*((b*(c + d*x))/(b*c - a*d))^n*((b*(e + f*x))/(b*e - a*f))^p)

Rule 159

Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_)*((e_.) + (f_.)*(x_))^(p_)*((g_.) + (h_.)*(x_)), x_Symbol] := Dist[h/b, Int[(a + b*x)^(m + 1)*(c + d*x)^n*(e + f*x)^p, x], x] + Dist[(b*g - a*h)/b, Int[(a + b*x)^m*(c + d*x)^n*(e + f*x)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n, p}, x] && (SumSimplerQ[m, 1] || (!SumSimplerQ[n, 1] && !SumSimplerQ[p, 1]))

Rule 140

```
Int[((a_) + (b_)*(x_))^(m_)*((c_) + (d_)*(x_))^(n_)*((e_) + (f_)*(x_))
^(p_), x_Symbol] :> Dist[(c + d*x)^FracPart[n]/((b/(b*c - a*d))^IntPart[n]*
((b*(c + d*x))/(b*c - a*d))^FracPart[n]), Int[(a + b*x)^m*((b*c)/(b*c - a*d)
) + (b*d*x)/(b*c - a*d))^n*(e + f*x)^p, x], x] /; FreeQ[{a, b, c, d, e, f,
m, n, p}, x] && !IntegerQ[m] && !IntegerQ[n] && !IntegerQ[p] && !GtQ[b/
(b*c - a*d), 0] && !SimplerQ[c + d*x, a + b*x] && !SimplerQ[e + f*x, a +
b*x]
```

Rule 139

```
Int[((a_) + (b_)*(x_))^(m_)*((c_) + (d_)*(x_))^(n_)*((e_) + (f_)*(x_))
^(p_), x_Symbol] :> Dist[(e + f*x)^FracPart[p]/((b/(b*e - a*f))^IntPart[p]*
((b*(e + f*x))/(b*e - a*f))^FracPart[p]), Int[(a + b*x)^m*(c + d*x)^n*((b*e)
)/(b*e - a*f) + (b*f*x)/(b*e - a*f))^p, x], x] /; FreeQ[{a, b, c, d, e, f,
m, n, p}, x] && !IntegerQ[m] && !IntegerQ[n] && !IntegerQ[p] && GtQ[b/(b
*c - a*d), 0] && !GtQ[b/(b*e - a*f), 0]
```

Rule 138

```
Int[((a_) + (b_)*(x_))^(m_)*((c_) + (d_)*(x_))^(n_)*((e_) + (f_)*(x_))
^(p_), x_Symbol] :> Simp[((a + b*x)^(m + 1)*AppellF1[m + 1, -n, -p, m + 2,
-((d*(a + b*x))/(b*c - a*d)), -(f*(a + b*x))/(b*e - a*f)])/ (b*(m + 1)*(b/
(b*c - a*d))^n*(b/(b*e - a*f))^p), x] /; FreeQ[{a, b, c, d, e, f, m, n, p},
x] && !IntegerQ[m] && !IntegerQ[n] && !IntegerQ[p] && GtQ[b/(b*c - a*d)
, 0] && GtQ[b/(b*e - a*f), 0] && !(GtQ[d/(d*a - c*b), 0] && GtQ[d/(d*e - c
*f), 0] && SimplerQ[c + d*x, a + b*x]) && !(GtQ[f/(f*a - e*b), 0] && GtQ[f
/(f*c - e*d), 0] && SimplerQ[e + f*x, a + b*x])
```

Rubi steps

$$\begin{aligned}
\int \frac{(A+Bx)(c+dx)^n(e+fx)^p}{\sqrt{a+bx}} dx &= \frac{B \int \sqrt{a+bx}(c+dx)^n(e+fx)^p dx}{b} + \frac{(Ab-aB) \int \frac{(c+dx)^n(e+fx)^p}{\sqrt{a+bx}} dx}{b} \\
&= \frac{\left(B(c+dx)^n \left(\frac{b(c+dx)}{bc-ad} \right)^{-n} \right) \int \sqrt{a+bx} \left(\frac{bc}{bc-ad} + \frac{bdx}{bc-ad} \right)^n (e+fx)^p dx}{b} + \frac{\left((Ab-aB)(c+dx)^n \right) \int \frac{(c+dx)^n(e+fx)^p}{\sqrt{a+bx}} dx}{b} \\
&= \frac{\left(B(c+dx)^n \left(\frac{b(c+dx)}{bc-ad} \right)^{-n} (e+fx)^p \left(\frac{b(e+fx)}{be-af} \right)^{-p} \right) \int \sqrt{a+bx} \left(\frac{bc}{bc-ad} + \frac{bdx}{bc-ad} \right)^n \left(\frac{be}{be-af} + \frac{bf}{be-af} \right)^p dx}{b} \\
&= \frac{2(Ab-aB)\sqrt{a+bx}(c+dx)^n \left(\frac{b(c+dx)}{bc-ad} \right)^{-n} (e+fx)^p \left(\frac{b(e+fx)}{be-af} \right)^{-p} F_1 \left(\frac{1}{2}; -n, -p; \frac{3}{2}; -\frac{d(a+bx)}{ad-bc}, \frac{f(a+bx)}{af-be} \right) + B(a+bx) F_1 \left(\frac{3}{2}; -n, -p; \frac{5}{2}; -\frac{d(a+bx)}{ad-bc}, \frac{f(a+bx)}{af-be} \right)}{b^2}
\end{aligned}$$

Mathematica [A] time = 0.20808, size = 184, normalized size = 0.74

$$\frac{2\sqrt{a+bx}(c+dx)^n(e+fx)^p \left(\frac{b(c+dx)}{bc-ad} \right)^{-n} \left(\frac{b(e+fx)}{be-af} \right)^{-p} \left(3(Ab-aB)F_1 \left(\frac{1}{2}; -n, -p; \frac{3}{2}; \frac{d(a+bx)}{ad-bc}, \frac{f(a+bx)}{af-be} \right) + B(a+bx)F_1 \left(\frac{3}{2}; -n, -p; \frac{5}{2}; \frac{d(a+bx)}{ad-bc}, \frac{f(a+bx)}{af-be} \right) \right)}{3b^2}$$

Antiderivative was successfully verified.

[In] Integrate[((A + B*x)*(c + d*x)^n*(e + f*x)^p)/Sqrt[a + b*x], x]

[Out] (2*Sqrt[a + b*x]*(c + d*x)^n*(e + f*x)^p*(3*(A*b - a*B)*AppellF1[1/2, -n, -p, 3/2, (d*(a + b*x))/(-b*c) + a*d], (f*(a + b*x))/(-b*e) + a*f]) + B*(a + b*x)*AppellF1[3/2, -n, -p, 5/2, (d*(a + b*x))/(-b*c) + a*d], (f*(a + b*x))/(-b*e) + a*f]))/(3*b^2*((b*(c + d*x))/(b*c - a*d))^n*((b*(e + f*x))/(b*e - a*f))^p)

Maple [F] time = 0.059, size = 0, normalized size = 0.

$$\int (Bx + A)(dx + c)^n (fx + e)^p \frac{1}{\sqrt{bx + a}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((B*x+A)*(d*x+c)^n*(f*x+e)^p/(b*x+a)^(1/2), x)

[Out] `int((B*x+A)*(d*x+c)^n*(f*x+e)^p/(b*x+a)^(1/2),x)`

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(Bx + A)(dx + c)^n (fx + e)^p}{\sqrt{bx + a}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((B*x+A)*(d*x+c)^n*(f*x+e)^p/(b*x+a)^(1/2),x, algorithm="maxima")`

[Out] `integrate((B*x + A)*(d*x + c)^n*(f*x + e)^p/sqrt(b*x + a), x)`

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{(Bx + A)(dx + c)^n (fx + e)^p}{\sqrt{bx + a}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((B*x+A)*(d*x+c)^n*(f*x+e)^p/(b*x+a)^(1/2),x, algorithm="fricas")`

[Out] `integral((B*x + A)*(d*x + c)^n*(f*x + e)^p/sqrt(b*x + a), x)`

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((B*x+A)*(d*x+c)**n*(f*x+e)**p/(b*x+a)**(1/2),x)`

[Out] Timed out

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(Bx + A)(dx + c)^n (fx + e)^p}{\sqrt{bx + a}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((B*x+A)*(d*x+c)^n*(f*x+e)^p/(b*x+a)^(1/2),x, algorithm="giac")
```

```
[Out] integrate((B*x + A)*(d*x + c)^n*(f*x + e)^p/sqrt(b*x + a), x)
```

3.139 $\int (a + bx)^m (c + dx)^n (e + fx)^p (g + hx)^3 dx$

Optimal. Leaf size=530

$$\frac{3h^2(bg - ah)(a + bx)^{m+3}(c + dx)^n(e + fx)^p \left(\frac{b(c+dx)}{bc-ad}\right)^{-n} \left(\frac{b(e+fx)}{be-af}\right)^{-p} F_1\left(m + 3; -n, -p; m + 4; -\frac{d(a+bx)}{bc-ad}, -\frac{f(a+bx)}{be-af}\right)}{b^4(m + 3)} + \frac{(bg - a}{$$

[Out] $((b*g - a*h)^3*(a + b*x)^(1 + m)*(c + d*x)^n*(e + f*x)^p*AppellF1[1 + m, -n, -p, 2 + m, -((d*(a + b*x))/(b*c - a*d)), -((f*(a + b*x))/(b*e - a*f))])/(b^4*(1 + m)*((b*(c + d*x))/(b*c - a*d))^n*((b*(e + f*x))/(b*e - a*f))^p) + (3*h*(b*g - a*h)^2*(a + b*x)^(2 + m)*(c + d*x)^n*(e + f*x)^p*AppellF1[2 + m, -n, -p, 3 + m, -((d*(a + b*x))/(b*c - a*d)), -((f*(a + b*x))/(b*e - a*f))])/(b^4*(2 + m)*((b*(c + d*x))/(b*c - a*d))^n*((b*(e + f*x))/(b*e - a*f))^p) + (3*h^2*(b*g - a*h)*(a + b*x)^(3 + m)*(c + d*x)^n*(e + f*x)^p*AppellF1[3 + m, -n, -p, 4 + m, -((d*(a + b*x))/(b*c - a*d)), -((f*(a + b*x))/(b*e - a*f))])/(b^4*(3 + m)*((b*(c + d*x))/(b*c - a*d))^n*((b*(e + f*x))/(b*e - a*f))^p) + (h^3*(a + b*x)^(4 + m)*(c + d*x)^n*(e + f*x)^p*AppellF1[4 + m, -n, -p, 5 + m, -((d*(a + b*x))/(b*c - a*d)), -((f*(a + b*x))/(b*e - a*f))])/(b^4*(4 + m)*((b*(c + d*x))/(b*c - a*d))^n*((b*(e + f*x))/(b*e - a*f))^p)$

Rubi [A] time = 1.17864, antiderivative size = 530, normalized size of antiderivative = 1., number of steps used = 31, number of rules used = 5, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.172$, Rules used = {181, 159, 140, 139, 138}

$$\frac{3h^2(bg - ah)(a + bx)^{m+3}(c + dx)^n(e + fx)^p \left(\frac{b(c+dx)}{bc-ad}\right)^{-n} \left(\frac{b(e+fx)}{be-af}\right)^{-p} F_1\left(m + 3; -n, -p; m + 4; -\frac{d(a+bx)}{bc-ad}, -\frac{f(a+bx)}{be-af}\right)}{b^4(m + 3)} + \frac{(bg - a}{$$

Antiderivative was successfully verified.

[In] Int[(a + b*x)^m*(c + d*x)^n*(e + f*x)^p*(g + h*x)^3,x]

[Out] $((b*g - a*h)^3*(a + b*x)^(1 + m)*(c + d*x)^n*(e + f*x)^p*AppellF1[1 + m, -n, -p, 2 + m, -((d*(a + b*x))/(b*c - a*d)), -((f*(a + b*x))/(b*e - a*f))])/(b^4*(1 + m)*((b*(c + d*x))/(b*c - a*d))^n*((b*(e + f*x))/(b*e - a*f))^p) + (3*h*(b*g - a*h)^2*(a + b*x)^(2 + m)*(c + d*x)^n*(e + f*x)^p*AppellF1[2 + m, -n, -p, 3 + m, -((d*(a + b*x))/(b*c - a*d)), -((f*(a + b*x))/(b*e - a*f))])/(b^4*(2 + m)*((b*(c + d*x))/(b*c - a*d))^n*((b*(e + f*x))/(b*e - a*f))^p) + (3*h^2*(b*g - a*h)*(a + b*x)^(3 + m)*(c + d*x)^n*(e + f*x)^p*AppellF1[3 + m, -n, -p, 4 + m, -((d*(a + b*x))/(b*c - a*d)), -((f*(a + b*x))/(b*e - a*f))])/(b^4*(3 + m)*((b*(c + d*x))/(b*c - a*d))^n*((b*(e + f*x))/(b*e - a*f))^p)$

$$\left. \right)^p) + (h^3(a + b*x)^{(4 + m)}*(c + d*x)^n*(e + f*x)^p*AppellF1[4 + m, -n, -p, 5 + m, -((d*(a + b*x))/(b*c - a*d)), -((f*(a + b*x))/(b*e - a*f))])/(b^4*(4 + m)*((b*(c + d*x))/(b*c - a*d))^n*((b*(e + f*x))/(b*e - a*f))^p)$$

Rule 181

$$\text{Int}[(a_. + (b_.)*(x_.))^{(m_.)}*((c_.) + (d_.)*(x_.))^{(n_.)}*((e_.) + (f_.)*(x_.))^{(p_.)}*((g_.) + (h_.)*(x_.))^{(q_.)}, x_Symbol] \rightarrow \text{Dist}[h/b, \text{Int}[(a + b*x)^{(m + 1)}*(c + d*x)^n*(e + f*x)^p*(g + h*x)^{(q - 1)}, x], x] + \text{Dist}[(b*g - a*h)/b, \text{Int}[(a + b*x)^m*(c + d*x)^n*(e + f*x)^p*(g + h*x)^{(q - 1)}, x], x] /; \text{FreeQ}[\{a, b, c, d, e, f, g, h, m, n, p\}, x] \&\& \text{IGtQ}[q, 0] \&\& (\text{SumSimplerQ}[m, 1] || (!\text{SumSimplerQ}[n, 1] \&\& !\text{SumSimplerQ}[p, 1]))$$

Rule 159

$$\text{Int}[(a_. + (b_.)*(x_.))^{(m_.)}*((c_.) + (d_.)*(x_.))^{(n_.)}*((e_.) + (f_.)*(x_.))^{(p_.)}*((g_.) + (h_.)*(x_.)), x_Symbol] \rightarrow \text{Dist}[h/b, \text{Int}[(a + b*x)^{(m + 1)}*(c + d*x)^n*(e + f*x)^p, x], x] + \text{Dist}[(b*g - a*h)/b, \text{Int}[(a + b*x)^m*(c + d*x)^n*(e + f*x)^p, x], x] /; \text{FreeQ}[\{a, b, c, d, e, f, g, h, m, n, p\}, x] \&\& (\text{SumSimplerQ}[m, 1] || (!\text{SumSimplerQ}[n, 1] \&\& !\text{SumSimplerQ}[p, 1]))$$

Rule 140

$$\text{Int}[(a_. + (b_.)*(x_.))^{(m_.)}*((c_.) + (d_.)*(x_.))^{(n_.)}*((e_.) + (f_.)*(x_.))^{(p_.)}, x_Symbol] \rightarrow \text{Dist}[(c + d*x)^{\text{FracPart}[n]}*((b/(b*c - a*d))^{\text{IntPart}[n]}*((b*(c + d*x))/(b*c - a*d))^{\text{FracPart}[n]}), \text{Int}[(a + b*x)^m*((b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d))^n*(e + f*x)^p, x], x] /; \text{FreeQ}[\{a, b, c, d, e, f, m, n, p\}, x] \&\& !\text{IntegerQ}[m] \&\& !\text{IntegerQ}[n] \&\& !\text{IntegerQ}[p] \&\& !\text{GtQ}[b/(b*c - a*d), 0] \&\& !\text{SimplerQ}[c + d*x, a + b*x] \&\& !\text{SimplerQ}[e + f*x, a + b*x]$$

Rule 139

$$\text{Int}[(a_. + (b_.)*(x_.))^{(m_.)}*((c_.) + (d_.)*(x_.))^{(n_.)}*((e_.) + (f_.)*(x_.))^{(p_.)}, x_Symbol] \rightarrow \text{Dist}[(e + f*x)^{\text{FracPart}[p]}*((b/(b*e - a*f))^{\text{IntPart}[p]}*((b*(e + f*x))/(b*e - a*f))^{\text{FracPart}[p]}), \text{Int}[(a + b*x)^m*(c + d*x)^n*((b*e)/(b*e - a*f) + (b*f*x)/(b*e - a*f))^p, x], x] /; \text{FreeQ}[\{a, b, c, d, e, f, m, n, p\}, x] \&\& !\text{IntegerQ}[m] \&\& !\text{IntegerQ}[n] \&\& !\text{IntegerQ}[p] \&\& \text{GtQ}[b/(b*c - a*d), 0] \&\& !\text{GtQ}[b/(b*e - a*f), 0]$$

Rule 138

$$\text{Int}[(a_. + (b_.)*(x_.))^{(m_.)}*((c_.) + (d_.)*(x_.))^{(n_.)}*((e_.) + (f_.)*(x_.))^{(p_.)}, x_Symbol] \rightarrow \text{Simp}[(a + b*x)^{(m + 1)}*AppellF1[m + 1, -n, -p, m + 2, -((d*(a + b*x))/(b*c - a*d)), -((f*(a + b*x))/(b*e - a*f))])/(b*(m + 1)*(b/$$

```
(b*c - a*d))^n*(b/(b*e - a*f))^p), x] /; FreeQ[{a, b, c, d, e, f, m, n, p},
x] && !IntegerQ[m] && !IntegerQ[n] && !IntegerQ[p] && GtQ[b/(b*c - a*d)
, 0] && GtQ[b/(b*e - a*f), 0] && !(GtQ[d/(d*a - c*b), 0] && GtQ[d/(d*e - c
*f), 0] && SimplerQ[c + d*x, a + b*x]) && !(GtQ[f/(f*a - e*b), 0] && GtQ[f
/(f*c - e*d), 0] && SimplerQ[e + f*x, a + b*x])
```

Rubi steps

$$\begin{aligned}
\int (a + bx)^m (c + dx)^n (e + fx)^p (g + hx)^3 dx &= \frac{h \int (a + bx)^{1+m} (c + dx)^n (e + fx)^p (g + hx)^2 dx}{b} + \frac{(bg - ah) \int (a + bx)^m (c + dx)^n (e + fx)^p (g + hx) dx}{b} \\
&= \frac{h^2 \int (a + bx)^{2+m} (c + dx)^n (e + fx)^p (g + hx) dx}{b^2} + 2 \frac{(h(bg - ah)) \int (a + bx)^{1+m} (c + dx)^n (e + fx)^p dx}{b^2} \\
&= \frac{h^3 \int (a + bx)^{3+m} (c + dx)^n (e + fx)^p dx}{b^3} + \frac{(h^2(bg - ah)) \int (a + bx)^{2+m} (c + dx)^n (e + fx)^p dx}{b^3} \\
&= \frac{\left(h^3 (c + dx)^n \left(\frac{b(c+dx)}{bc-ad} \right)^{-n} \right) \int (a + bx)^{3+m} \left(\frac{bc}{bc-ad} + \frac{bdx}{bc-ad} \right)^n (e + fx)^p dx}{b^3} + \frac{\left(h^2 (bg - ah) \int (a + bx)^{2+m} (c + dx)^n (e + fx)^p dx \right)}{b^3} \\
&= \frac{\left(h^3 (c + dx)^n \left(\frac{b(c+dx)}{bc-ad} \right)^{-n} (e + fx)^p \left(\frac{b(e+fx)}{be-af} \right)^{-p} \right) \int (a + bx)^{3+m} \left(\frac{bc}{bc-ad} + \frac{bdx}{bc-ad} \right)^n dx}{b^3} \\
&= \frac{(bg - ah)^3 (a + bx)^{1+m} (c + dx)^n \left(\frac{b(c+dx)}{bc-ad} \right)^{-n} (e + fx)^p \left(\frac{b(e+fx)}{be-af} \right)^{-p} F_1 \left(1 + m; \right)}{b^4(1 + m)}
\end{aligned}$$

Mathematica [F] time = 4.52404, size = 0, normalized size = 0.

$$\int (a + bx)^m (c + dx)^n (e + fx)^p (g + hx)^3 dx$$

Verification is Not applicable to the result.

[In] Integrate[(a + b*x)^m*(c + d*x)^n*(e + f*x)^p*(g + h*x)^3,x]

[Out] Integrate[(a + b*x)^m*(c + d*x)^n*(e + f*x)^p*(g + h*x)^3, x]

Maple [F] time = 0.25, size = 0, normalized size = 0.

$$\int (bx + a)^m (dx + c)^n (fx + e)^p (hx + g)^3 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b*x+a)^m*(d*x+c)^n*(f*x+e)^p*(h*x+g)^3,x)

[Out] int((b*x+a)^m*(d*x+c)^n*(f*x+e)^p*(h*x+g)^3,x)

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (hx + g)^3 (bx + a)^m (dx + c)^n (fx + e)^p dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b*x+a)^m*(d*x+c)^n*(f*x+e)^p*(h*x+g)^3,x, algorithm="maxima")

[Out] integrate((h*x + g)^3*(b*x + a)^m*(d*x + c)^n*(f*x + e)^p, x)

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\left(h^3x^3 + 3gh^2x^2 + 3g^2hx + g^3\right)(bx + a)^m(dx + c)^n(fx + e)^p, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b*x+a)^m*(d*x+c)^n*(f*x+e)^p*(h*x+g)^3,x, algorithm="fricas")

[Out] integral((h^3*x^3 + 3*g*h^2*x^2 + 3*g^2*h*x + g^3)*(b*x + a)^m*(d*x + c)^n*(f*x + e)^p, x)

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)**m*(d*x+c)**n*(f*x+e)**p*(h*x+g)**3,x)
```

```
[Out] Timed out
```

Giac [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^m*(d*x+c)^n*(f*x+e)^p*(h*x+g)^3,x, algorithm="giac")
```

```
[Out] Timed out
```

3.140 $\int (a + bx)^m (c + dx)^n (e + fx)^p (g + hx)^2 dx$

Optimal. Leaf size=393

$$\frac{(bg - ah)^2 (a + bx)^{m+1} (c + dx)^n (e + fx)^p \left(\frac{b(c+dx)}{bc-ad}\right)^{-n} \left(\frac{b(e+fx)}{be-af}\right)^{-p} F_1\left(m+1; -n, -p; m+2; -\frac{d(a+bx)}{bc-ad}, -\frac{f(a+bx)}{be-af}\right)}{b^3(m+1)} + \frac{2h(bg - ah)}{b^3(m+1)}$$

[Out] $((b*g - a*h)^2*(a + b*x)^(1 + m)*(c + d*x)^n*(e + f*x)^p*AppellF1[1 + m, -n, -p, 2 + m, -((d*(a + b*x))/(b*c - a*d)), -(f*(a + b*x))/(b*e - a*f)])/(b^3*(1 + m)*((b*(c + d*x))/(b*c - a*d))^n*((b*(e + f*x))/(b*e - a*f))^p) + (2*h*(b*g - a*h)*(a + b*x)^(2 + m)*(c + d*x)^n*(e + f*x)^p*AppellF1[2 + m, -n, -p, 3 + m, -((d*(a + b*x))/(b*c - a*d)), -(f*(a + b*x))/(b*e - a*f)])/(b^3*(2 + m)*((b*(c + d*x))/(b*c - a*d))^n*((b*(e + f*x))/(b*e - a*f))^p) + (h^2*(a + b*x)^(3 + m)*(c + d*x)^n*(e + f*x)^p*AppellF1[3 + m, -n, -p, 4 + m, -((d*(a + b*x))/(b*c - a*d)), -(f*(a + b*x))/(b*e - a*f)])/(b^3*(3 + m)*((b*(c + d*x))/(b*c - a*d))^n*((b*(e + f*x))/(b*e - a*f))^p)$

Rubi [A] time = 0.492588, antiderivative size = 393, normalized size of antiderivative = 1., number of steps used = 15, number of rules used = 5, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.172$, Rules used = {181, 159, 140, 139, 138}

$$\frac{(bg - ah)^2 (a + bx)^{m+1} (c + dx)^n (e + fx)^p \left(\frac{b(c+dx)}{bc-ad}\right)^{-n} \left(\frac{b(e+fx)}{be-af}\right)^{-p} F_1\left(m+1; -n, -p; m+2; -\frac{d(a+bx)}{bc-ad}, -\frac{f(a+bx)}{be-af}\right)}{b^3(m+1)} + \frac{2h(bg - ah)}{b^3(m+1)}$$

Antiderivative was successfully verified.

[In] Int[(a + b*x)^m*(c + d*x)^n*(e + f*x)^p*(g + h*x)^2,x]

[Out] $((b*g - a*h)^2*(a + b*x)^(1 + m)*(c + d*x)^n*(e + f*x)^p*AppellF1[1 + m, -n, -p, 2 + m, -((d*(a + b*x))/(b*c - a*d)), -(f*(a + b*x))/(b*e - a*f)])/(b^3*(1 + m)*((b*(c + d*x))/(b*c - a*d))^n*((b*(e + f*x))/(b*e - a*f))^p) + (2*h*(b*g - a*h)*(a + b*x)^(2 + m)*(c + d*x)^n*(e + f*x)^p*AppellF1[2 + m, -n, -p, 3 + m, -((d*(a + b*x))/(b*c - a*d)), -(f*(a + b*x))/(b*e - a*f)])/(b^3*(2 + m)*((b*(c + d*x))/(b*c - a*d))^n*((b*(e + f*x))/(b*e - a*f))^p) + (h^2*(a + b*x)^(3 + m)*(c + d*x)^n*(e + f*x)^p*AppellF1[3 + m, -n, -p, 4 + m, -((d*(a + b*x))/(b*c - a*d)), -(f*(a + b*x))/(b*e - a*f)])/(b^3*(3 + m)*((b*(c + d*x))/(b*c - a*d))^n*((b*(e + f*x))/(b*e - a*f))^p)$

Rule 181


```

Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_)*((e_.) + (f_.)*(x_))
^(p_)*((g_.) + (h_.)*(x_))^(q_), x_Symbol] := Dist[h/b, Int[(a + b*x)^(m +
1)*(c + d*x)^n*(e + f*x)^p*(g + h*x)^(q - 1), x], x] + Dist[(b*g - a*h)/b,
Int[(a + b*x)^m*(c + d*x)^n*(e + f*x)^p*(g + h*x)^(q - 1), x], x] /; FreeQ
[{a, b, c, d, e, f, g, h, m, n, p}, x] && IGtQ[q, 0] && (SumSimplerQ[m, 1]
|| ( !SumSimplerQ[n, 1] && !SumSimplerQ[p, 1]))

```

Rule 159

```

Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_)*((e_.) + (f_.)*(x_))
^(p_)*((g_.) + (h_.)*(x_)), x_Symbol] := Dist[h/b, Int[(a + b*x)^(m + 1)*(
c + d*x)^n*(e + f*x)^p, x], x] + Dist[(b*g - a*h)/b, Int[(a + b*x)^m*(c + d
*x)^n*(e + f*x)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n, p}, x] &&
(SumSimplerQ[m, 1] || ( !SumSimplerQ[n, 1] && !SumSimplerQ[p, 1]))

```

Rule 140

```

Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_)*((e_.) + (f_.)*(x_))
^(p_), x_Symbol] := Dist[(c + d*x)^FracPart[n]/((b/(b*c - a*d))^IntPart[n]*
((b*(c + d*x))/(b*c - a*d))^FracPart[n]), Int[(a + b*x)^m*((b*c)/(b*c - a*d)
+ (b*d*x)/(b*c - a*d))^n*(e + f*x)^p, x], x] /; FreeQ[{a, b, c, d, e, f,
m, n, p}, x] && !IntegerQ[m] && !IntegerQ[n] && !IntegerQ[p] && !GtQ[b/
(b*c - a*d), 0] && !SimplerQ[c + d*x, a + b*x] && !SimplerQ[e + f*x, a +
b*x]

```

Rule 139

```

Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_)*((e_.) + (f_.)*(x_))
^(p_), x_Symbol] := Dist[(e + f*x)^FracPart[p]/((b/(b*e - a*f))^IntPart[p]*
((b*(e + f*x))/(b*e - a*f))^FracPart[p]), Int[(a + b*x)^m*(c + d*x)^n*((b*e)
)/(b*e - a*f) + (b*f*x)/(b*e - a*f))^p, x], x] /; FreeQ[{a, b, c, d, e, f,
m, n, p}, x] && !IntegerQ[m] && !IntegerQ[n] && !IntegerQ[p] && GtQ[b/(b
*c - a*d), 0] && !GtQ[b/(b*e - a*f), 0]

```

Rule 138

```

Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_)*((e_.) + (f_.)*(x_))
^(p_), x_Symbol] := Simp[((a + b*x)^(m + 1)*AppellF1[m + 1, -n, -p, m + 2,
-((d*(a + b*x))/(b*c - a*d)), -((f*(a + b*x))/(b*e - a*f))])/(b*(m + 1)*(b/
(b*c - a*d))^n*(b/(b*e - a*f))^p), x] /; FreeQ[{a, b, c, d, e, f, m, n, p},
x] && !IntegerQ[m] && !IntegerQ[n] && !IntegerQ[p] && GtQ[b/(b*c - a*d)
, 0] && GtQ[b/(b*e - a*f), 0] && !(GtQ[d/(d*a - c*b), 0] && GtQ[d/(d*e - c
*f), 0] && SimplerQ[c + d*x, a + b*x]) && !(GtQ[f/(f*a - e*b), 0] && GtQ[f
/(f*c - e*d), 0] && SimplerQ[e + f*x, a + b*x])

```

Rubi steps

$$\begin{aligned}
\int (a + bx)^m (c + dx)^n (e + fx)^p (g + hx)^2 dx &= \frac{h \int (a + bx)^{1+m} (c + dx)^n (e + fx)^p (g + hx) dx}{b} + \frac{(bg - ah) \int (a + bx)^m (c + dx)^n (e + fx)^p dx}{b} \\
&= \frac{h^2 \int (a + bx)^{2+m} (c + dx)^n (e + fx)^p dx}{b^2} + 2 \frac{(h(bg - ah)) \int (a + bx)^{1+m} (c + dx)^n (e + fx)^p dx}{b^2} \\
&= \frac{\left(h^2 (c + dx)^n \left(\frac{b(c+dx)}{bc-ad} \right)^{-n} \right) \int (a + bx)^{2+m} \left(\frac{bc}{bc-ad} + \frac{bdx}{bc-ad} \right)^n (e + fx)^p dx}{b^2} + 2 \frac{\left(h^2 (c + dx)^n \left(\frac{b(c+dx)}{bc-ad} \right)^{-n} \right) \int (a + bx)^{1+m} \left(\frac{bc}{bc-ad} + \frac{bdx}{bc-ad} \right)^n (e + fx)^p dx}{b^2} \\
&= \frac{\left(h^2 (c + dx)^n \left(\frac{b(c+dx)}{bc-ad} \right)^{-n} (e + fx)^p \left(\frac{b(e+fx)}{be-af} \right)^{-p} \right) \int (a + bx)^{2+m} \left(\frac{bc}{bc-ad} + \frac{bdx}{bc-ad} \right)^n dx}{b^2} \\
&= \frac{(bg - ah)^2 (a + bx)^{1+m} (c + dx)^n \left(\frac{b(c+dx)}{bc-ad} \right)^{-n} (e + fx)^p \left(\frac{b(e+fx)}{be-af} \right)^{-p} F_1 \left(1 + m; - \right)}{b^3 (1 + m)}
\end{aligned}$$

Mathematica [F] time = 1.486, size = 0, normalized size = 0.

$$\int (a + bx)^m (c + dx)^n (e + fx)^p (g + hx)^2 dx$$

Verification is Not applicable to the result.

[In] Integrate[(a + b*x)^m*(c + d*x)^n*(e + f*x)^p*(g + h*x)^2,x]

[Out] Integrate[(a + b*x)^m*(c + d*x)^n*(e + f*x)^p*(g + h*x)^2, x]

Maple [F] time = 0.173, size = 0, normalized size = 0.

$$\int (bx + a)^m (dx + c)^n (fx + e)^p (hx + g)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b*x+a)^m*(d*x+c)^n*(f*x+e)^p*(h*x+g)^2,x)

[Out] int((b*x+a)^m*(d*x+c)^n*(f*x+e)^p*(h*x+g)^2,x)

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (hx + g)^2 (bx + a)^m (dx + c)^n (fx + e)^p dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b*x+a)^m*(d*x+c)^n*(f*x+e)^p*(h*x+g)^2,x, algorithm="maxima")

[Out] integrate((h*x + g)^2*(b*x + a)^m*(d*x + c)^n*(f*x + e)^p, x)

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\left(h^2x^2 + 2ghx + g^2\right)(bx + a)^m(dx + c)^n(fx + e)^p, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b*x+a)^m*(d*x+c)^n*(f*x+e)^p*(h*x+g)^2,x, algorithm="fricas")

[Out] integral((h^2*x^2 + 2*g*h*x + g^2)*(b*x + a)^m*(d*x + c)^n*(f*x + e)^p, x)

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b*x+a)**m*(d*x+c)**n*(f*x+e)**p*(h*x+g)**2,x)

[Out] Timed out

Giac [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^m*(d*x+c)^n*(f*x+e)^p*(h*x+g)^2,x, algorithm="giac")
```

```
[Out] Timed out
```

3.141 $\int (a + bx)^m (c + dx)^n (e + fx)^p (g + hx) dx$

Optimal. Leaf size=256

$$\frac{(bg - ah)(a + bx)^{m+1}(c + dx)^n(e + fx)^p \left(\frac{b(c+dx)}{bc-ad}\right)^{-n} \left(\frac{b(e+fx)}{be-af}\right)^{-p} F_1\left(m+1; -n, -p; m+2; -\frac{d(a+bx)}{bc-ad}, -\frac{f(a+bx)}{be-af}\right)}{b^2(m+1)} + \frac{h(a + bx)^m}{b}$$

[Out] $((b*g - a*h)*(a + b*x)^{(1 + m)*(c + d*x)^n*(e + f*x)^p*AppellF1[1 + m, -n, -p, 2 + m, -((d*(a + b*x))/(b*c - a*d)), -((f*(a + b*x))/(b*e - a*f))])/(b^{2*(1 + m)*((b*(c + d*x))/(b*c - a*d))^n*((b*(e + f*x))/(b*e - a*f))^p) + (h*(a + b*x)^{(2 + m)*(c + d*x)^n*(e + f*x)^p*AppellF1[2 + m, -n, -p, 3 + m, -((d*(a + b*x))/(b*c - a*d)), -((f*(a + b*x))/(b*e - a*f))])/(b^{2*(2 + m)*((b*(c + d*x))/(b*c - a*d))^n*((b*(e + f*x))/(b*e - a*f))^p)$

Rubi [A] time = 0.210448, antiderivative size = 256, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 4, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.148$, Rules used = {159, 140, 139, 138}

$$\frac{(bg - ah)(a + bx)^{m+1}(c + dx)^n(e + fx)^p \left(\frac{b(c+dx)}{bc-ad}\right)^{-n} \left(\frac{b(e+fx)}{be-af}\right)^{-p} F_1\left(m+1; -n, -p; m+2; -\frac{d(a+bx)}{bc-ad}, -\frac{f(a+bx)}{be-af}\right)}{b^2(m+1)} + \frac{h(a + bx)^m}{b}$$

Antiderivative was successfully verified.

[In] Int[(a + b*x)^m*(c + d*x)^n*(e + f*x)^p*(g + h*x), x]

[Out] $((b*g - a*h)*(a + b*x)^{(1 + m)*(c + d*x)^n*(e + f*x)^p*AppellF1[1 + m, -n, -p, 2 + m, -((d*(a + b*x))/(b*c - a*d)), -((f*(a + b*x))/(b*e - a*f))])/(b^{2*(1 + m)*((b*(c + d*x))/(b*c - a*d))^n*((b*(e + f*x))/(b*e - a*f))^p) + (h*(a + b*x)^{(2 + m)*(c + d*x)^n*(e + f*x)^p*AppellF1[2 + m, -n, -p, 3 + m, -((d*(a + b*x))/(b*c - a*d)), -((f*(a + b*x))/(b*e - a*f))])/(b^{2*(2 + m)*((b*(c + d*x))/(b*c - a*d))^n*((b*(e + f*x))/(b*e - a*f))^p)$

Rule 159

Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_)*((e_.) + (f_.)*(x_))^(p_)*((g_.) + (h_.)*(x_)), x_Symbol] := Dist[h/b, Int[(a + b*x)^(m + 1)*(c + d*x)^n*(e + f*x)^p, x], x] + Dist[(b*g - a*h)/b, Int[(a + b*x)^m*(c + d*x)^n*(e + f*x)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n, p}, x] && (SumSimplerQ[m, 1] || (!SumSimplerQ[n, 1] && !SumSimplerQ[p, 1]))

Rule 140

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_)*((e_.) + (f_.)*(x_))
^(p_), x_Symbol] :> Dist[(c + d*x)^FracPart[n]/((b/(b*c - a*d))^IntPart[n]*
((b*(c + d*x))/(b*c - a*d))^FracPart[n]), Int[(a + b*x)^m*((b*c)/(b*c - a*d)
) + (b*d*x)/(b*c - a*d)^n*(e + f*x)^p, x], x] /; FreeQ[{a, b, c, d, e, f,
m, n, p}, x] && !IntegerQ[m] && !IntegerQ[n] && !IntegerQ[p] && !GtQ[b/
(b*c - a*d), 0] && !SimplerQ[c + d*x, a + b*x] && !SimplerQ[e + f*x, a +
b*x]
```

Rule 139

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_)*((e_.) + (f_.)*(x_))
^(p_), x_Symbol] :> Dist[(e + f*x)^FracPart[p]/((b/(b*e - a*f))^IntPart[p]*
((b*(e + f*x))/(b*e - a*f))^FracPart[p]), Int[(a + b*x)^m*(c + d*x)^n*((b*e)
)/(b*e - a*f) + (b*f*x)/(b*e - a*f)^p, x], x] /; FreeQ[{a, b, c, d, e, f,
m, n, p}, x] && !IntegerQ[m] && !IntegerQ[n] && !IntegerQ[p] && GtQ[b/(b
*c - a*d), 0] && !GtQ[b/(b*e - a*f), 0]
```

Rule 138

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_)*((e_.) + (f_.)*(x_))
^(p_), x_Symbol] :> Simp[((a + b*x)^(m + 1)*AppellF1[m + 1, -n, -p, m + 2,
-((d*(a + b*x))/(b*c - a*d)), -(f*(a + b*x))/(b*e - a*f)]/(b*(m + 1)*(b/
(b*c - a*d))^n*(b/(b*e - a*f))^p), x] /; FreeQ[{a, b, c, d, e, f, m, n, p},
x] && !IntegerQ[m] && !IntegerQ[n] && !IntegerQ[p] && GtQ[b/(b*c - a*d)
, 0] && GtQ[b/(b*e - a*f), 0] && !(GtQ[d/(d*a - c*b), 0] && GtQ[d/(d*e - c
*f), 0] && SimplerQ[c + d*x, a + b*x]) && !(GtQ[f/(f*a - e*b), 0] && GtQ[f
/(f*c - e*d), 0] && SimplerQ[e + f*x, a + b*x])
```

Rubi steps

$$\begin{aligned}
\int (a + bx)^m (c + dx)^n (e + fx)^p (g + hx) dx &= \frac{h \int (a + bx)^{1+m} (c + dx)^n (e + fx)^p dx}{b} + \frac{(bg - ah) \int (a + bx)^m (c + dx)^n (e + fx)^p dx}{b} \\
&= \frac{\left(h(c + dx)^n \left(\frac{b(c+dx)}{bc-ad} \right)^{-n} \right) \int (a + bx)^{1+m} \left(\frac{bc}{bc-ad} + \frac{bdx}{bc-ad} \right)^n (e + fx)^p dx}{b} + \frac{(bg - ah) \int (a + bx)^m (c + dx)^n (e + fx)^p dx}{b} \\
&= \frac{\left(h(c + dx)^n \left(\frac{b(c+dx)}{bc-ad} \right)^{-n} (e + fx)^p \left(\frac{b(e+fx)}{be-af} \right)^{-p} \right) \int (a + bx)^{1+m} \left(\frac{bc}{bc-ad} + \frac{bdx}{bc-ad} \right)^n dx}{b} \\
&= \frac{(bg - ah)(a + bx)^{1+m} (c + dx)^n \left(\frac{b(c+dx)}{bc-ad} \right)^{-n} (e + fx)^p \left(\frac{b(e+fx)}{be-af} \right)^{-p} F_1 \left(1 + m; - \right)}{b^2(1 + m)}
\end{aligned}$$

Mathematica [F] time = 0.905266, size = 0, normalized size = 0.

$$\int (a + bx)^m (c + dx)^n (e + fx)^p (g + hx) dx$$

Verification is Not applicable to the result.

[In] Integrate[(a + b*x)^m*(c + d*x)^n*(e + f*x)^p*(g + h*x), x]

[Out] Integrate[(a + b*x)^m*(c + d*x)^n*(e + f*x)^p*(g + h*x), x]

Maple [F] time = 0.148, size = 0, normalized size = 0.

$$\int (bx + a)^m (dx + c)^n (fx + e)^p (hx + g) dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b*x+a)^m*(d*x+c)^n*(f*x+e)^p*(h*x+g), x)

[Out] int((b*x+a)^m*(d*x+c)^n*(f*x+e)^p*(h*x+g), x)

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (hx + g)(bx + a)^m (dx + c)^n (fx + e)^p dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b*x+a)^m*(d*x+c)^n*(f*x+e)^p*(h*x+g),x, algorithm="maxima")

[Out] integrate((h*x + g)*(b*x + a)^m*(d*x + c)^n*(f*x + e)^p, x)

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\left(hx + g\right)\left(bx + a\right)^m\left(dx + c\right)^n\left(fx + e\right)^p, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b*x+a)^m*(d*x+c)^n*(f*x+e)^p*(h*x+g),x, algorithm="fricas")

[Out] integral((h*x + g)*(b*x + a)^m*(d*x + c)^n*(f*x + e)^p, x)

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b*x+a)**m*(d*x+c)**n*(f*x+e)**p*(h*x+g),x)

[Out] Timed out

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (hx + g)(bx + a)^m(dx + c)^n(fx + e)^p dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b*x+a)^m*(d*x+c)^n*(f*x+e)^p*(h*x+g),x, algorithm="giac")

[Out] integrate((h*x + g)*(b*x + a)^m*(d*x + c)^n*(f*x + e)^p, x)

3.142 $\int (a + bx)^m (c + dx)^n (e + fx)^p dx$

Optimal. Leaf size=123

$$\frac{(a + bx)^{m+1} (c + dx)^n (e + fx)^p \left(\frac{b(c+dx)}{bc-ad}\right)^{-n} \left(\frac{b(e+fx)}{be-af}\right)^{-p} F_1\left(m+1; -n, -p; m+2; -\frac{d(a+bx)}{bc-ad}, -\frac{f(a+bx)}{be-af}\right)}{b(m+1)}$$

[Out] ((a + b*x)^(1 + m)*(c + d*x)^n*(e + f*x)^p*AppellF1[1 + m, -n, -p, 2 + m, -((d*(a + b*x))/(b*c - a*d)), -((f*(a + b*x))/(b*e - a*f))])/(b*(1 + m)*((b*(c + d*x))/(b*c - a*d))^n*((b*(e + f*x))/(b*e - a*f))^p)

Rubi [A] time = 0.0830603, antiderivative size = 123, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}} = 0.136$, Rules used = {140, 139, 138}

$$\frac{(a + bx)^{m+1} (c + dx)^n (e + fx)^p \left(\frac{b(c+dx)}{bc-ad}\right)^{-n} \left(\frac{b(e+fx)}{be-af}\right)^{-p} F_1\left(m+1; -n, -p; m+2; -\frac{d(a+bx)}{bc-ad}, -\frac{f(a+bx)}{be-af}\right)}{b(m+1)}$$

Antiderivative was successfully verified.

[In] Int[(a + b*x)^m*(c + d*x)^n*(e + f*x)^p,x]

[Out] ((a + b*x)^(1 + m)*(c + d*x)^n*(e + f*x)^p*AppellF1[1 + m, -n, -p, 2 + m, -((d*(a + b*x))/(b*c - a*d)), -((f*(a + b*x))/(b*e - a*f))])/(b*(1 + m)*((b*(c + d*x))/(b*c - a*d))^n*((b*(e + f*x))/(b*e - a*f))^p)

Rule 140

Int[((a_) + (b_)*(x_))^(m_)*((c_) + (d_)*(x_))^(n_)*((e_) + (f_)*(x_))^(p_), x_Symbol] :> Dist[(c + d*x)^FracPart[n]/((b/(b*c - a*d))^IntPart[n]*((b*(c + d*x))/(b*c - a*d))^FracPart[n]), Int[(a + b*x)^m*((b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d))^n*(e + f*x)^p, x], x] /; FreeQ[{a, b, c, d, e, f, m, n, p}, x] && !IntegerQ[m] && !IntegerQ[n] && !IntegerQ[p] && !GtQ[b/(b*c - a*d), 0] && !SimplerQ[c + d*x, a + b*x] && !SimplerQ[e + f*x, a + b*x]

Rule 139

Int[((a_) + (b_)*(x_))^(m_)*((c_) + (d_)*(x_))^(n_)*((e_) + (f_)*(x_))^(p_), x_Symbol] :> Dist[(e + f*x)^FracPart[p]/((b/(b*e - a*f))^IntPart[p]*

```
((b*(e + f*x))/(b*e - a*f))^FracPart[p]), Int[(a + b*x)^m*(c + d*x)^n*((b*e
)/(b*e - a*f) + (b*f*x)/(b*e - a*f))^p, x], x] /; FreeQ[{a, b, c, d, e, f,
m, n, p}, x] && !IntegerQ[m] && !IntegerQ[n] && !IntegerQ[p] && GtQ[b/(b
*c - a*d), 0] && !GtQ[b/(b*e - a*f), 0]
```

Rule 138

```
Int[((a_) + (b_)*(x_))^(m_)*((c_) + (d_)*(x_))^(n_)*((e_) + (f_)*(x_))
^(p_), x_Symbol] :> Simp[((a + b*x)^(m + 1)*AppellF1[m + 1, -n, -p, m + 2,
-((d*(a + b*x))/(b*c - a*d)), -(f*(a + b*x))/(b*e - a*f)]/(b*(m + 1)*(b/
(b*c - a*d))^n*(b/(b*e - a*f))^p), x] /; FreeQ[{a, b, c, d, e, f, m, n, p},
x] && !IntegerQ[m] && !IntegerQ[n] && !IntegerQ[p] && GtQ[b/(b*c - a*d)
, 0] && GtQ[b/(b*e - a*f), 0] && !(GtQ[d/(d*a - c*b), 0] && GtQ[d/(d*e - c
*f), 0] && SimplerQ[c + d*x, a + b*x]) && !(GtQ[f/(f*a - e*b), 0] && GtQ[f
/(f*c - e*d), 0] && SimplerQ[e + f*x, a + b*x])
```

Rubi steps

$$\begin{aligned} \int (a + bx)^m (c + dx)^n (e + fx)^p dx &= \left((c + dx)^n \left(\frac{b(c + dx)}{bc - ad} \right)^{-n} \right) \int (a + bx)^m \left(\frac{bc}{bc - ad} + \frac{bdx}{bc - ad} \right)^n (e + fx)^p dx \\ &= \left((c + dx)^n \left(\frac{b(c + dx)}{bc - ad} \right)^{-n} (e + fx)^p \left(\frac{b(e + fx)}{be - af} \right)^{-p} \right) \int (a + bx)^m \left(\frac{bc}{bc - ad} + \frac{bdx}{bc - ad} \right)^n \\ &= \frac{(a + bx)^{1+m} (c + dx)^n \left(\frac{b(c + dx)}{bc - ad} \right)^{-n} (e + fx)^p \left(\frac{b(e + fx)}{be - af} \right)^{-p} F_1 \left(1 + m; -n, -p; 2 + m; -\frac{d(a + bx)}{bc - ad}, \frac{f(a + bx)}{af - be} \right)}{b(1 + m)} \end{aligned}$$

Mathematica [A] time = 0.133515, size = 121, normalized size = 0.98

$$\frac{(a + bx)^{m+1} (c + dx)^n (e + fx)^p \left(\frac{b(c + dx)}{bc - ad} \right)^{-n} \left(\frac{b(e + fx)}{be - af} \right)^{-p} F_1 \left(m + 1; -n, -p; m + 2; \frac{d(a + bx)}{ad - bc}, \frac{f(a + bx)}{af - be} \right)}{b(m + 1)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x)^m*(c + d*x)^n*(e + f*x)^p,x]
```

```
[Out] ((a + b*x)^(1 + m)*(c + d*x)^n*(e + f*x)^p*AppellF1[1 + m, -n, -p, 2 + m, (
d*(a + b*x))/(-(b*c) + a*d), (f*(a + b*x))/(-(b*e) + a*f)]/(b*(1 + m)*((b*
(c + d*x))/(b*c - a*d))^n*((b*(e + f*x))/(b*e - a*f))^p)
```

Maple [F] time = 0.002, size = 0, normalized size = 0.

$$\int (bx + a)^m (dx + c)^n (fx + e)^p dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b*x+a)^m*(d*x+c)^n*(f*x+e)^p,x)

[Out] int((b*x+a)^m*(d*x+c)^n*(f*x+e)^p,x)

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (bx + a)^m (dx + c)^n (fx + e)^p dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b*x+a)^m*(d*x+c)^n*(f*x+e)^p,x, algorithm="maxima")

[Out] integrate((b*x + a)^m*(d*x + c)^n*(f*x + e)^p, x)

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left((bx + a)^m (dx + c)^n (fx + e)^p, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b*x+a)^m*(d*x+c)^n*(f*x+e)^p,x, algorithm="fricas")

[Out] integral((b*x + a)^m*(d*x + c)^n*(f*x + e)^p, x)

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)**m*(d*x+c)**n*(f*x+e)**p,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (bx + a)^m (dx + c)^n (fx + e)^p dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^m*(d*x+c)^n*(f*x+e)^p,x, algorithm="giac")
```

```
[Out] integrate((b*x + a)^m*(d*x + c)^n*(f*x + e)^p, x)
```

$$3.143 \quad \int \frac{(a+bx)^m(c+dx)^n(e+fx)^p}{g+hx} dx$$

Optimal. Leaf size=31

$$\text{CannotIntegrate}\left(\frac{(a+bx)^m(c+dx)^n(e+fx)^p}{g+hx}, x\right)$$

[Out] Defer[Int][((a + b*x)^m*(c + d*x)^n*(e + f*x)^p)/(g + h*x), x]

Rubi [A] time = 0.0075481, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.$, Rules used = {}

$$\int \frac{(a+bx)^m(c+dx)^n(e+fx)^p}{g+hx} dx$$

Verification is Not applicable to the result.

[In] Int[((a + b*x)^m*(c + d*x)^n*(e + f*x)^p)/(g + h*x), x]

[Out] Defer[Int][((a + b*x)^m*(c + d*x)^n*(e + f*x)^p)/(g + h*x), x]

Rubi steps

$$\int \frac{(a+bx)^m(c+dx)^n(e+fx)^p}{g+hx} dx = \int \frac{(a+bx)^m(c+dx)^n(e+fx)^p}{g+hx} dx$$

Mathematica [A] time = 0.25432, size = 0, normalized size = 0.

$$\int \frac{(a+bx)^m(c+dx)^n(e+fx)^p}{g+hx} dx$$

Verification is Not applicable to the result.

[In] Integrate[((a + b*x)^m*(c + d*x)^n*(e + f*x)^p)/(g + h*x), x]

[Out] Integrate[((a + b*x)^m*(c + d*x)^n*(e + f*x)^p)/(g + h*x), x]

Maple [A] time = 0.157, size = 0, normalized size = 0.

$$\int \frac{(bx + a)^m (dx + c)^n (fx + e)^p}{hx + g} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b*x+a)^m*(d*x+c)^n*(f*x+e)^p/(h*x+g),x)

[Out] int((b*x+a)^m*(d*x+c)^n*(f*x+e)^p/(h*x+g),x)

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bx + a)^m (dx + c)^n (fx + e)^p}{hx + g} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b*x+a)^m*(d*x+c)^n*(f*x+e)^p/(h*x+g),x, algorithm="maxima")

[Out] integrate((b*x + a)^m*(d*x + c)^n*(f*x + e)^p/(h*x + g), x)

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{(bx + a)^m (dx + c)^n (fx + e)^p}{hx + g}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b*x+a)^m*(d*x+c)^n*(f*x+e)^p/(h*x+g),x, algorithm="fricas")

[Out] integral((b*x + a)^m*(d*x + c)^n*(f*x + e)^p/(h*x + g), x)

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((b*x+a)**m*(d*x+c)**n*(f*x+e)**p/(h*x+g),x)`

[Out] Timed out

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bx + a)^m (dx + c)^n (fx + e)^p}{hx + g} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((b*x+a)^m*(d*x+c)^n*(f*x+e)^p/(h*x+g),x, algorithm="giac")`

[Out] `integrate((b*x + a)^m*(d*x + c)^n*(f*x + e)^p/(h*x + g), x)`

3.144 $\int (a + bx)^m (A + Bx)(c + dx)^n (e + fx)^{-m-n} dx$

Optimal. Leaf size=268

$$\frac{(Ab - aB)(a + bx)^{m+1}(c + dx)^n(e + fx)^{-m-n} \left(\frac{b(c+dx)}{bc-ad}\right)^{-n} \left(\frac{b(e+fx)}{be-af}\right)^{m+n} F_1\left(m+1; -n, m+n; m+2; -\frac{d(a+bx)}{bc-ad}, -\frac{f(a+bx)}{be-af}\right)}{b^2(m+1)} + \dots$$

[Out] ((A*b - a*B)*(a + b*x)^(1 + m)*(c + d*x)^n*(e + f*x)^(-m - n)*((b*(e + f*x))/(b*e - a*f))^(m + n)*AppellF1[1 + m, -n, m + n, 2 + m, -((d*(a + b*x))/(b*c - a*d)), -(f*(a + b*x)/(b*e - a*f))]/(b^2*(1 + m)*((b*(c + d*x))/(b*c - a*d))^n) + (B*(a + b*x)^(2 + m)*(c + d*x)^n*(e + f*x)^(-m - n)*((b*(e + f*x))/(b*e - a*f))^(m + n)*AppellF1[2 + m, -n, m + n, 3 + m, -((d*(a + b*x))/(b*c - a*d)), -(f*(a + b*x)/(b*e - a*f))]/(b^2*(2 + m)*((b*(c + d*x))/(b*c - a*d))^n)

Rubi [A] time = 0.211948, antiderivative size = 268, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 4, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}} = 0.121$, Rules used = {159, 140, 139, 138}

$$\frac{(Ab - aB)(a + bx)^{m+1}(c + dx)^n(e + fx)^{-m-n} \left(\frac{b(c+dx)}{bc-ad}\right)^{-n} \left(\frac{b(e+fx)}{be-af}\right)^{m+n} F_1\left(m+1; -n, m+n; m+2; -\frac{d(a+bx)}{bc-ad}, -\frac{f(a+bx)}{be-af}\right)}{b^2(m+1)} + \dots$$

Antiderivative was successfully verified.

[In] Int[(a + b*x)^m*(A + B*x)*(c + d*x)^n*(e + f*x)^(-m - n), x]

[Out] ((A*b - a*B)*(a + b*x)^(1 + m)*(c + d*x)^n*(e + f*x)^(-m - n)*((b*(e + f*x))/(b*e - a*f))^(m + n)*AppellF1[1 + m, -n, m + n, 2 + m, -((d*(a + b*x))/(b*c - a*d)), -(f*(a + b*x)/(b*e - a*f))]/(b^2*(1 + m)*((b*(c + d*x))/(b*c - a*d))^n) + (B*(a + b*x)^(2 + m)*(c + d*x)^n*(e + f*x)^(-m - n)*((b*(e + f*x))/(b*e - a*f))^(m + n)*AppellF1[2 + m, -n, m + n, 3 + m, -((d*(a + b*x))/(b*c - a*d)), -(f*(a + b*x)/(b*e - a*f))]/(b^2*(2 + m)*((b*(c + d*x))/(b*c - a*d))^n)

Rule 159

Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_)*((e_.) + (f_.)*(x_))^(p_)*((g_.) + (h_.)*(x_)), x_Symbol] := Dist[h/b, Int[(a + b*x)^(m + 1)*(c + d*x)^n*(e + f*x)^p, x], x] + Dist[(b*g - a*h)/b, Int[(a + b*x)^m*(c + d*x)^n*(e + f*x)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n, p}, x] &&

(SumSimplerQ[m, 1] || (!SumSimplerQ[n, 1] && !SumSimplerQ[p, 1]))

Rule 140

Int[((a_) + (b_)*(x_))^(m_)*((c_) + (d_)*(x_))^(n_)*((e_) + (f_)*(x_))^(p_), x_Symbol] :> Dist[(c + d*x)^FracPart[n]/((b/(b*c - a*d))^IntPart[n]*((b*(c + d*x))/(b*c - a*d))^FracPart[n]), Int[(a + b*x)^m*((b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d))^n*(e + f*x)^p, x], x] /; FreeQ[{a, b, c, d, e, f, m, n, p}, x] && !IntegerQ[m] && !IntegerQ[n] && !IntegerQ[p] && !GtQ[b/(b*c - a*d), 0] && !SimplerQ[c + d*x, a + b*x] && !SimplerQ[e + f*x, a + b*x]

Rule 139

Int[((a_) + (b_)*(x_))^(m_)*((c_) + (d_)*(x_))^(n_)*((e_) + (f_)*(x_))^(p_), x_Symbol] :> Dist[(e + f*x)^FracPart[p]/((b/(b*e - a*f))^IntPart[p]*((b*(e + f*x))/(b*e - a*f))^FracPart[p]), Int[(a + b*x)^m*(c + d*x)^n*((b*e)/(b*e - a*f) + (b*f*x)/(b*e - a*f))^p, x], x] /; FreeQ[{a, b, c, d, e, f, m, n, p}, x] && !IntegerQ[m] && !IntegerQ[n] && !IntegerQ[p] && GtQ[b/(b*c - a*d), 0] && !GtQ[b/(b*e - a*f), 0]

Rule 138

Int[((a_) + (b_)*(x_))^(m_)*((c_) + (d_)*(x_))^(n_)*((e_) + (f_)*(x_))^(p_), x_Symbol] :> Simp[((a + b*x)^(m + 1)*AppellF1[m + 1, -n, -p, m + 2, -(d*(a + b*x))/(b*c - a*d), -(f*(a + b*x))/(b*e - a*f)])/((b*(m + 1)*(b/(b*c - a*d))^n*(b/(b*e - a*f))^p), x] /; FreeQ[{a, b, c, d, e, f, m, n, p}, x] && !IntegerQ[m] && !IntegerQ[n] && !IntegerQ[p] && GtQ[b/(b*c - a*d), 0] && GtQ[b/(b*e - a*f), 0] && !(GtQ[d/(d*a - c*b), 0] && GtQ[d/(d*e - c*f), 0] && SimplerQ[c + d*x, a + b*x]) && !(GtQ[f/(f*a - e*b), 0] && GtQ[f/(f*c - e*d), 0] && SimplerQ[e + f*x, a + b*x])

Rubi steps

$$\begin{aligned}
\int (a + bx)^m (A + Bx)(c + dx)^n (e + fx)^{-m-n} dx &= \frac{B \int (a + bx)^{1+m} (c + dx)^n (e + fx)^{-m-n} dx}{b} + \frac{(Ab - aB) \int (a + bx)^m (c + dx)^n (e + fx)^{-m-n} dx}{b} \\
&= \frac{\left(B(c + dx)^n \left(\frac{b(c+dx)}{bc-ad} \right)^{-n} \right) \int (a + bx)^{1+m} \left(\frac{bc}{bc-ad} + \frac{bdx}{bc-ad} \right)^n (e + fx)^{-m-n} dx}{b} \\
&= \frac{\left(B(c + dx)^n \left(\frac{b(c+dx)}{bc-ad} \right)^{-n} (e + fx)^{-m-n} \left(\frac{b(e+fx)}{be-af} \right)^{m+n} \right) \int (a + bx)^{1+m} \left(\frac{bc}{bc-ad} + \frac{bdx}{bc-ad} \right)^n (e + fx)^{-m-n} dx}{b} \\
&= \frac{(Ab - aB)(a + bx)^{1+m} (c + dx)^n \left(\frac{b(c+dx)}{bc-ad} \right)^{-n} (e + fx)^{-m-n} \left(\frac{b(e+fx)}{be-af} \right)^{m+n} F_1 \left(\frac{b(c+dx)}{bc-ad}, \frac{b(e+fx)}{be-af}, \frac{b(c+dx)}{bc-ad} \right)}{b^2(1+m)}
\end{aligned}$$

Mathematica [F] time = 0.636679, size = 0, normalized size = 0.

$$\int (a + bx)^m (A + Bx)(c + dx)^n (e + fx)^{-m-n} dx$$

Verification is Not applicable to the result.

[In] Integrate[(a + b*x)^m*(A + B*x)*(c + d*x)^n*(e + f*x)^(-m - n), x]

[Out] Integrate[(a + b*x)^m*(A + B*x)*(c + d*x)^n*(e + f*x)^(-m - n), x]

Maple [F] time = 0.151, size = 0, normalized size = 0.

$$\int (bx + a)^m (Bx + A)(dx + c)^n (fx + e)^{-n-m} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b*x+a)^m*(B*x+A)*(d*x+c)^n*(f*x+e)^(-n-m), x)

[Out] int((b*x+a)^m*(B*x+A)*(d*x+c)^n*(f*x+e)^(-n-m), x)

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (Bx + A)(bx + a)^m (dx + c)^n (fx + e)^{-m-n} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((b*x+a)^m*(B*x+A)*(d*x+c)^n*(f*x+e)^(-m-n),x, algorithm="maxima")`

[Out] `integrate((B*x + A)*(b*x + a)^m*(d*x + c)^n*(f*x + e)^(-m - n), x)`

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left((Bx + A)(bx + a)^m(dx + c)^n(fx + e)^{-m-n}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((b*x+a)^m*(B*x+A)*(d*x+c)^n*(f*x+e)^(-m-n),x, algorithm="fricas")`

[Out] `integral((B*x + A)*(b*x + a)^m*(d*x + c)^n*(f*x + e)^(-m - n), x)`

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((b*x+a)**m*(B*x+A)*(d*x+c)**n*(f*x+e)**(-m-n),x)`

[Out] Timed out

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (Bx + A)(bx + a)^m(dx + c)^n(fx + e)^{-m-n} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((b*x+a)^m*(B*x+A)*(d*x+c)^n*(f*x+e)^(-m-n),x, algorithm="giac")`

[Out] `integrate((B*x + A)*(b*x + a)^m*(d*x + c)^n*(f*x + e)^(-m - n), x)`

3.145 $\int (a + bx)^m (A + Bx)(c + dx)^n (e + fx)^{-1-m-n} dx$

Optimal. Leaf size=283

$$\frac{B(a + bx)^{m+1}(c + dx)^n(e + fx)^{-m-n} \left(\frac{b(c+dx)}{bc-ad}\right)^{-n} \left(\frac{b(e+fx)}{be-af}\right)^{m+n} F_1\left(m+1; -n, m+n; m+2; -\frac{d(a+bx)}{bc-ad}, -\frac{f(a+bx)}{be-af}\right)}{bf(m+1)} (a + bx)^{m+1}$$

[Out] (B*(a + b*x)^(1 + m)*(c + d*x)^n*(e + f*x)^(-m - n)*((b*(e + f*x))/(b*e - a*f))^(m + n)*AppellF1[1 + m, -n, m + n, 2 + m, -((d*(a + b*x))/(b*c - a*d)), -((f*(a + b*x))/(b*e - a*f))]/(b*f*(1 + m)*((b*(c + d*x))/(b*c - a*d))^n) - ((B*e - A*f)*(a + b*x)^(1 + m)*(c + d*x)^n*(e + f*x)^(-m - n)*((b*(e + f*x))/(b*e - a*f))^(m + n)*AppellF1[1 + m, -n, 1 + m + n, 2 + m, -((d*(a + b*x))/(b*c - a*d)), -((f*(a + b*x))/(b*e - a*f))]/(f*(b*e - a*f)*(1 + m)*((b*(c + d*x))/(b*c - a*d))^n)

Rubi [A] time = 0.208066, antiderivative size = 283, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 4, integrand size = 34, $\frac{\text{number of rules}}{\text{integrand size}} = 0.118$, Rules used = {159, 140, 139, 138}

$$\frac{B(a + bx)^{m+1}(c + dx)^n(e + fx)^{-m-n} \left(\frac{b(c+dx)}{bc-ad}\right)^{-n} \left(\frac{b(e+fx)}{be-af}\right)^{m+n} F_1\left(m+1; -n, m+n; m+2; -\frac{d(a+bx)}{bc-ad}, -\frac{f(a+bx)}{be-af}\right)}{bf(m+1)} (a + bx)^{m+1}$$

Antiderivative was successfully verified.

[In] Int[(a + b*x)^m*(A + B*x)*(c + d*x)^n*(e + f*x)^(-1 - m - n), x]

[Out] (B*(a + b*x)^(1 + m)*(c + d*x)^n*(e + f*x)^(-m - n)*((b*(e + f*x))/(b*e - a*f))^(m + n)*AppellF1[1 + m, -n, m + n, 2 + m, -((d*(a + b*x))/(b*c - a*d)), -((f*(a + b*x))/(b*e - a*f))]/(b*f*(1 + m)*((b*(c + d*x))/(b*c - a*d))^n) - ((B*e - A*f)*(a + b*x)^(1 + m)*(c + d*x)^n*(e + f*x)^(-m - n)*((b*(e + f*x))/(b*e - a*f))^(m + n)*AppellF1[1 + m, -n, 1 + m + n, 2 + m, -((d*(a + b*x))/(b*c - a*d)), -((f*(a + b*x))/(b*e - a*f))]/(f*(b*e - a*f)*(1 + m)*((b*(c + d*x))/(b*c - a*d))^n)

Rule 159

Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_)*((e_.) + (f_.)*(x_))^(p_)*((g_.) + (h_.)*(x_)), x_Symbol] := Dist[h/b, Int[(a + b*x)^(m + 1)*(c + d*x)^n*(e + f*x)^p, x], x] + Dist[(b*g - a*h)/b, Int[(a + b*x)^m*(c + d*x)^n*(e + f*x)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n, p}, x] &&

(SumSimplerQ[m, 1] || (!SumSimplerQ[n, 1] && !SumSimplerQ[p, 1]))

Rule 140

Int[((a_) + (b_)*(x_))^(m_)*((c_) + (d_)*(x_))^(n_)*((e_) + (f_)*(x_))^(p_), x_Symbol] :> Dist[(c + d*x)^FracPart[n]/((b/(b*c - a*d))^IntPart[n]*((b*(c + d*x))/(b*c - a*d))^FracPart[n]), Int[(a + b*x)^m*((b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d))^n*(e + f*x)^p, x], x] /; FreeQ[{a, b, c, d, e, f, m, n, p}, x] && !IntegerQ[m] && !IntegerQ[n] && !IntegerQ[p] && !GtQ[b/(b*c - a*d), 0] && !SimplerQ[c + d*x, a + b*x] && !SimplerQ[e + f*x, a + b*x]

Rule 139

Int[((a_) + (b_)*(x_))^(m_)*((c_) + (d_)*(x_))^(n_)*((e_) + (f_)*(x_))^(p_), x_Symbol] :> Dist[(e + f*x)^FracPart[p]/((b/(b*e - a*f))^IntPart[p]*((b*(e + f*x))/(b*e - a*f))^FracPart[p]), Int[(a + b*x)^m*(c + d*x)^n*((b*e)/(b*e - a*f) + (b*f*x)/(b*e - a*f))^p, x], x] /; FreeQ[{a, b, c, d, e, f, m, n, p}, x] && !IntegerQ[m] && !IntegerQ[n] && !IntegerQ[p] && GtQ[b/(b*c - a*d), 0] && !GtQ[b/(b*e - a*f), 0]

Rule 138

Int[((a_) + (b_)*(x_))^(m_)*((c_) + (d_)*(x_))^(n_)*((e_) + (f_)*(x_))^(p_), x_Symbol] :> Simp[((a + b*x)^(m + 1)*AppellF1[m + 1, -n, -p, m + 2, -(d*(a + b*x))/(b*c - a*d), -(f*(a + b*x))/(b*e - a*f)])/((b*(m + 1)*(b/(b*c - a*d))^n*(b/(b*e - a*f))^p), x] /; FreeQ[{a, b, c, d, e, f, m, n, p}, x] && !IntegerQ[m] && !IntegerQ[n] && !IntegerQ[p] && GtQ[b/(b*c - a*d), 0] && GtQ[b/(b*e - a*f), 0] && !(GtQ[d/(d*a - c*b), 0] && GtQ[d/(d*e - c*f), 0] && SimplerQ[c + d*x, a + b*x]) && !(GtQ[f/(f*a - e*b), 0] && GtQ[f/(f*c - e*d), 0] && SimplerQ[e + f*x, a + b*x])

Rubi steps

$$\begin{aligned}
\int (a + bx)^m (A + Bx)(c + dx)^n (e + fx)^{-1-m-n} dx &= \frac{B \int (a + bx)^m (c + dx)^n (e + fx)^{-m-n} dx}{f} + \frac{(-Be + Af) \int (a + bx)^m (c + dx)^n (e + fx)^{-m-n} dx}{f} \\
&= \frac{\left(B(c + dx)^n \left(\frac{b(c+dx)}{bc-ad} \right)^{-n} \right) \int (a + bx)^m \left(\frac{bc}{bc-ad} + \frac{bdx}{bc-ad} \right)^n (e + fx)^{-m-n} dx}{f} \\
&= \frac{\left(B(c + dx)^n \left(\frac{b(c+dx)}{bc-ad} \right)^{-n} (e + fx)^{-m-n} \left(\frac{b(e+fx)}{be-af} \right)^{m+n} \right) \int (a + bx)^m \left(\frac{bc}{bc-ad} + \frac{bdx}{bc-ad} \right)^n (e + fx)^{-m-n} dx}{f} \\
&= \frac{B(a + bx)^{1+m} (c + dx)^n \left(\frac{b(c+dx)}{bc-ad} \right)^{-n} (e + fx)^{-m-n} \left(\frac{b(e+fx)}{be-af} \right)^{m+n} F_1 \left(1 + m, -n, m + n + 1; m + 2; \frac{d(a+bx)}{ad-bc}, \frac{f(a+bx)}{af-be} \right)}{bf(1 + m)}
\end{aligned}$$

Mathematica [A] time = 0.320218, size = 208, normalized size = 0.73

$$\frac{(a + bx)^{m+1} (c + dx)^n (e + fx)^{-m-n+1} \left(\frac{b(c+dx)}{bc-ad} \right)^{-n} \left(\frac{b(e+fx)}{be-af} \right)^{m+n-1} \left(b(Af - Be) F_1 \left(m + 1; -n, m + n + 1; m + 2; \frac{d(a+bx)}{ad-bc}, \frac{f(a+bx)}{af-be} \right) \right)}{f(m + 1)(be - af)^2}$$

Antiderivative was successfully verified.

[In] Integrate[(a + b*x)^m*(A + B*x)*(c + d*x)^n*(e + f*x)^(-1 - m - n), x]

[Out] ((a + b*x)^(1 + m)*(c + d*x)^n*(e + f*x)^(1 - m - n)*((b*(e + f*x))/(b*e - a*f))^(-1 + m + n)*(B*(b*e - a*f)*AppellF1[1 + m, -n, m + n, 2 + m, (d*(a + b*x))/(-(b*c) + a*d), (f*(a + b*x))/(-(b*e) + a*f)] + b*(-(B*e) + A*f)*AppellF1[1 + m, -n, 1 + m + n, 2 + m, (d*(a + b*x))/(-(b*c) + a*d), (f*(a + b*x))/(-(b*e) + a*f)]))/(f*(b*e - a*f)^2*(1 + m)*((b*(c + d*x))/(b*c - a*d))^n)

Maple [F] time = 0.145, size = 0, normalized size = 0.

$$\int (bx + a)^m (Bx + A)(dx + c)^n (fx + e)^{-1-m-n} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b*x+a)^m*(B*x+A)*(d*x+c)^n*(f*x+e)^(-1-m-n), x)

[Out] $\text{int}((b*x+a)^m*(B*x+A)*(d*x+c)^n*(f*x+e)^{-1-m-n}, x)$

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (Bx + A)(bx + a)^m(dx + c)^n(fx + e)^{-m-n-1} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] $\text{integrate}((b*x+a)^m*(B*x+A)*(d*x+c)^n*(f*x+e)^{-1-m-n}, x, \text{algorithm}=\text{"maxima"})$

[Out] $\text{integrate}((B*x + A)*(b*x + a)^m*(d*x + c)^n*(f*x + e)^{-m - n - 1}, x)$

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left((Bx + A)(bx + a)^m(dx + c)^n(fx + e)^{-m-n-1}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] $\text{integrate}((b*x+a)^m*(B*x+A)*(d*x+c)^n*(f*x+e)^{-1-m-n}, x, \text{algorithm}=\text{"fricas"})$

[Out] $\text{integral}((B*x + A)*(b*x + a)^m*(d*x + c)^n*(f*x + e)^{-m - n - 1}, x)$

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] $\text{integrate}((b*x+a)**m*(B*x+A)*(d*x+c)**n*(f*x+e)**(-1-m-n), x)$

[Out] Timed out

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (Bx + A)(bx + a)^m(dx + c)^n(fx + e)^{-m-n-1} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^m*(B*x+A)*(d*x+c)^n*(f*x+e)^(-1-m-n),x, algorithm="giac")
```

```
[Out] integrate((B*x + A)*(b*x + a)^m*(d*x + c)^n*(f*x + e)^(-m - n - 1), x)
```


3.146 $\int (a + bx)^m (A + Bx)(c + dx)^n (e + fx)^{-2-m-n} dx$

Optimal. Leaf size=277

$$\frac{B(a + bx)^{m+1}(c + dx)^n(e + fx)^{-m-n} \left(\frac{b(c+dx)}{bc-ad}\right)^{-n} \left(\frac{b(e+fx)}{be-af}\right)^{m+n} F_1\left(m+1; -n, m+n+1; m+2; -\frac{d(a+bx)}{bc-ad}, -\frac{f(a+bx)}{be-af}\right)}{f(m+1)(be-af)} (a + b$$

[Out] (B*(a + b*x)^(1 + m)*(c + d*x)^n*(e + f*x)^(-m - n)*((b*(e + f*x))/(b*e - a*f))^(m + n)*AppellF1[1 + m, -n, 1 + m + n, 2 + m, -((d*(a + b*x))/(b*c - a*d)), -((f*(a + b*x))/(b*e - a*f))]/(f*(b*e - a*f)*(1 + m)*((b*(c + d*x))/(b*c - a*d))^n - ((B*e - A*f)*(a + b*x)^(1 + m)*(c + d*x)^n*(e + f*x)^(-1 - m - n)*Hypergeometric2F1[1 + m, -n, 2 + m, -(((d*e - c*f)*(a + b*x))/((b*c - a*d)*(e + f*x))))]/(f*(b*e - a*f)*(1 + m)*(((b*e - a*f)*(c + d*x))/((b*c - a*d)*(e + f*x)))^n)

Rubi [A] time = 0.147295, antiderivative size = 277, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 34, $\frac{\text{number of rules}}{\text{integrand size}} = 0.147$, Rules used = {159, 140, 139, 138, 132}

$$\frac{B(a + bx)^{m+1}(c + dx)^n(e + fx)^{-m-n} \left(\frac{b(c+dx)}{bc-ad}\right)^{-n} \left(\frac{b(e+fx)}{be-af}\right)^{m+n} F_1\left(m+1; -n, m+n+1; m+2; -\frac{d(a+bx)}{bc-ad}, -\frac{f(a+bx)}{be-af}\right)}{f(m+1)(be-af)} (a + b$$

Antiderivative was successfully verified.

[In] Int[(a + b*x)^m*(A + B*x)*(c + d*x)^n*(e + f*x)^(-2 - m - n), x]

[Out] (B*(a + b*x)^(1 + m)*(c + d*x)^n*(e + f*x)^(-m - n)*((b*(e + f*x))/(b*e - a*f))^(m + n)*AppellF1[1 + m, -n, 1 + m + n, 2 + m, -((d*(a + b*x))/(b*c - a*d)), -((f*(a + b*x))/(b*e - a*f))]/(f*(b*e - a*f)*(1 + m)*((b*(c + d*x))/(b*c - a*d))^n - ((B*e - A*f)*(a + b*x)^(1 + m)*(c + d*x)^n*(e + f*x)^(-1 - m - n)*Hypergeometric2F1[1 + m, -n, 2 + m, -(((d*e - c*f)*(a + b*x))/((b*c - a*d)*(e + f*x))))]/(f*(b*e - a*f)*(1 + m)*(((b*e - a*f)*(c + d*x))/((b*c - a*d)*(e + f*x)))^n)

Rule 159

Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_)*((e_.) + (f_.)*(x_))^(p_)*((g_.) + (h_.)*(x_)), x_Symbol] := Dist[h/b, Int[(a + b*x)^(m + 1)*(c + d*x)^n*(e + f*x)^p, x], x] + Dist[(b*g - a*h)/b, Int[(a + b*x)^m*(c + d*x)^n*(e + f*x)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n, p}, x] &&

(SumSimplerQ[m, 1] || (!SumSimplerQ[n, 1] && !SumSimplerQ[p, 1]))

Rule 140

Int[((a_) + (b_)*(x_))^(m_)*((c_) + (d_)*(x_))^(n_)*((e_) + (f_)*(x_))^(p_), x_Symbol] :> Dist[(c + d*x)^FracPart[n]/((b/(b*c - a*d))^IntPart[n]*((b*(c + d*x))/(b*c - a*d))^FracPart[n]), Int[(a + b*x)^m*((b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d))^n*(e + f*x)^p, x], x] /; FreeQ[{a, b, c, d, e, f, m, n, p}, x] && !IntegerQ[m] && !IntegerQ[n] && !IntegerQ[p] && !GtQ[b/(b*c - a*d), 0] && !SimplerQ[c + d*x, a + b*x] && !SimplerQ[e + f*x, a + b*x]

Rule 139

Int[((a_) + (b_)*(x_))^(m_)*((c_) + (d_)*(x_))^(n_)*((e_) + (f_)*(x_))^(p_), x_Symbol] :> Dist[(e + f*x)^FracPart[p]/((b/(b*e - a*f))^IntPart[p]*((b*(e + f*x))/(b*e - a*f))^FracPart[p]), Int[(a + b*x)^m*(c + d*x)^n*((b*e)/(b*e - a*f) + (b*f*x)/(b*e - a*f))^p, x], x] /; FreeQ[{a, b, c, d, e, f, m, n, p}, x] && !IntegerQ[m] && !IntegerQ[n] && !IntegerQ[p] && GtQ[b/(b*c - a*d), 0] && !GtQ[b/(b*e - a*f), 0]

Rule 138

Int[((a_) + (b_)*(x_))^(m_)*((c_) + (d_)*(x_))^(n_)*((e_) + (f_)*(x_))^(p_), x_Symbol] :> Simp[((a + b*x)^(m + 1)*AppellF1[m + 1, -n, -p, m + 2, -(d*(a + b*x))/(b*c - a*d), -(f*(a + b*x))/(b*e - a*f)]/(b*(m + 1)*(b/(b*c - a*d))^n*(b/(b*e - a*f))^p), x] /; FreeQ[{a, b, c, d, e, f, m, n, p}, x] && !IntegerQ[m] && !IntegerQ[n] && !IntegerQ[p] && GtQ[b/(b*c - a*d), 0] && GtQ[b/(b*e - a*f), 0] && !(GtQ[d/(d*a - c*b), 0] && GtQ[d/(d*e - c*f), 0] && SimplerQ[c + d*x, a + b*x]) && !(GtQ[f/(f*a - e*b), 0] && GtQ[f/(f*c - e*d), 0] && SimplerQ[e + f*x, a + b*x])

Rule 132

Int[((a_) + (b_)*(x_))^(m_)*((c_) + (d_)*(x_))^(n_)*((e_) + (f_)*(x_))^(p_), x_Symbol] :> Simp[((a + b*x)^(m + 1)*(c + d*x)^n*(e + f*x)^(p + 1)*Hypergeometric2F1[m + 1, -n, m + 2, -(((d*e - c*f)*(a + b*x))/((b*c - a*d)*(e + f*x)))]/(((b*e - a*f)*(m + 1))*((b*e - a*f)*(c + d*x))/((b*c - a*d)*(e + f*x))^n), x] /; FreeQ[{a, b, c, d, e, f, m, n, p}, x] && EqQ[m + n + p + 2, 0] && !IntegerQ[n]

Rubi steps

$$\begin{aligned}
\int (a + bx)^m (A + Bx)(c + dx)^n (e + fx)^{-2-m-n} dx &= \frac{B \int (a + bx)^m (c + dx)^n (e + fx)^{-1-m-n} dx}{f} + \frac{(-Be + Af) \int (a + bx)^m (c + dx)^n (e + fx)^{-1-m-n} dx}{f} \\
&= -\frac{(Be - Af)(a + bx)^{1+m} (c + dx)^n \left(\frac{(be-af)(c+dx)}{(bc-ad)(e+fx)}\right)^{-n} (e + fx)^{-1-m-n} {}_2F_1}{f(be - af)(1 + m)} \\
&= -\frac{(Be - Af)(a + bx)^{1+m} (c + dx)^n \left(\frac{(be-af)(c+dx)}{(bc-ad)(e+fx)}\right)^{-n} (e + fx)^{-1-m-n} {}_2F_1}{f(be - af)(1 + m)} \\
&= \frac{B(a + bx)^{1+m} (c + dx)^n \left(\frac{b(c+dx)}{bc-ad}\right)^{-n} (e + fx)^{-m-n} \left(\frac{b(e+fx)}{be-af}\right)^{m+n} F_1(1 + m)}{f(be - af)(1 + m)}
\end{aligned}$$

Mathematica [A] time = 0.442717, size = 215, normalized size = 0.78

$$\frac{(a + bx)^{m+1} (c + dx)^n (e + fx)^{-m-n-1} \left(\frac{b(c+dx)}{bc-ad}\right)^{-n} \left(\frac{b(e+fx)}{be-af}\right)^n \left((Af - Be) {}_2F_1\left(m + 1, -n; m + 2; \frac{(cf-de)(a+bx)}{(bc-ad)(e+fx)}\right) + B(e + fx) \left(\frac{b(e+fx)}{be-af}\right)^{m+n}\right)}{f(m + 1)(af - be)}$$

Warning: Unable to verify antiderivative.

[In] Integrate[(a + b*x)^m*(A + B*x)*(c + d*x)^n*(e + f*x)^(-2 - m - n), x]

[Out] -(((a + b*x)^(1 + m)*(c + d*x)^n*(e + f*x)^(-1 - m - n)*((b*(e + f*x))/(b*e - a*f))^(n*(B*(e + f*x)*((b*(e + f*x))/(b*e - a*f))^(m*AppellF1[1 + m, -n, 1 + m + n, 2 + m, (d*(a + b*x))/(-b*c) + a*d], (f*(a + b*x))/(-b*e) + a*f]) + (-B*e) + A*f)*Hypergeometric2F1[1 + m, -n, 2 + m, ((-d*e) + c*f)*(a + b*x)/((b*c - a*d)*(e + f*x))])/((f*(-b*e) + a*f)*(1 + m)*((b*(c + d*x))/(b*c - a*d))^n))

Maple [F] time = 0.143, size = 0, normalized size = 0.

$$\int (bx + a)^m (Bx + A)(dx + c)^n (fx + e)^{-2-m-n} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b*x+a)^m*(B*x+A)*(d*x+c)^n*(f*x+e)^(-2-m-n), x)

[Out] `int((b*x+a)^m*(B*x+A)*(d*x+c)^n*(f*x+e)^(-2-m-n),x)`

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (Bx + A)(bx + a)^m(dx + c)^n(fx + e)^{-m-n-2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((b*x+a)^m*(B*x+A)*(d*x+c)^n*(f*x+e)^(-2-m-n),x, algorithm="maxima")`

[Out] `integrate((B*x + A)*(b*x + a)^m*(d*x + c)^n*(f*x + e)^(-m - n - 2), x)`

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left((Bx + A)(bx + a)^m(dx + c)^n(fx + e)^{-m-n-2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((b*x+a)^m*(B*x+A)*(d*x+c)^n*(f*x+e)^(-2-m-n),x, algorithm="fricas")`

[Out] `integral((B*x + A)*(b*x + a)^m*(d*x + c)^n*(f*x + e)^(-m - n - 2), x)`

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((b*x+a)**m*(B*x+A)*(d*x+c)**n*(f*x+e)**(-2-m-n),x)`

[Out] Timed out

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (Bx + A)(bx + a)^m(dx + c)^n(fx + e)^{-m-n-2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b*x+a)^m*(B*x+A)*(d*x+c)^n*(f*x+e)^(-2-m-n),x, algorithm="giac")

[Out] integrate((B*x + A)*(b*x + a)^m*(d*x + c)^n*(f*x + e)^(-m - n - 2), x)

3.147 $\int (a + bx)^m (A + Bx)(c + dx)^n (e + fx)^{-3-m-n} dx$

Optimal. Leaf size=263

$$\frac{(a + bx)^{m+1}(Be - Af)(c + dx)^{n+1}(e + fx)^{-m-n-2}}{(m + n + 2)(be - af)(de - cf)} - \frac{(a + bx)^{m+1}(c + dx)^n(e + fx)^{-m-n-1} \left(\frac{(c+dx)(be-af)}{(e+fx)(bc-ad)} \right)^{-n} (a(Adf(m+1) +$$

[Out] $((B*e - A*f)*(a + b*x)^{(1 + m)}*(c + d*x)^{(1 + n)}*(e + f*x)^{(-2 - m - n)})/((b*e - a*f)*(d*e - c*f)*(2 + m + n)) - ((b*(B*c*e*(1 + m) + A*(c*f*(1 + n) - d*e*(2 + m + n))) + a*(A*d*f*(1 + m) + B*(d*e*(1 + n) - c*f*(2 + m + n))))*(a + b*x)^{(1 + m)}*(c + d*x)^n*(e + f*x)^{(-1 - m - n)}*Hypergeometric2F1[1 + m, -n, 2 + m, -(((d*e - c*f)*(a + b*x))/((b*c - a*d)*(e + f*x)))]/((b*e - a*f)^2*(d*e - c*f)*(1 + m)*(2 + m + n)*(((b*e - a*f)*(c + d*x))/((b*c - a*d)*(e + f*x))))^n$

Rubi [A] time = 0.226597, antiderivative size = 261, normalized size of antiderivative = 0.99, number of steps used = 3, number of rules used = 3, integrand size = 34, $\frac{\text{number of rules}}{\text{integrand size}} = 0.088$, Rules used = {155, 12, 132}

$$\frac{(a + bx)^{m+1}(Be - Af)(c + dx)^{n+1}(e + fx)^{-m-n-2}}{(m + n + 2)(be - af)(de - cf)} - \frac{(a + bx)^{m+1}(c + dx)^n(e + fx)^{-m-n-1} \left(\frac{(c+dx)(be-af)}{(e+fx)(bc-ad)} \right)^{-n} (a(Adf(m+1) -$$

Antiderivative was successfully verified.

[In] $\text{Int}[(a + b*x)^m*(A + B*x)*(c + d*x)^n*(e + f*x)^{-3 - m - n}, x]$

[Out] $((B*e - A*f)*(a + b*x)^{(1 + m)}*(c + d*x)^{(1 + n)}*(e + f*x)^{(-2 - m - n)})/((b*e - a*f)*(d*e - c*f)*(2 + m + n)) - ((b*(B*c*e*(1 + m) + A*c*f*(1 + n) - A*d*e*(2 + m + n)) + a*(A*d*f*(1 + m) + B*d*e*(1 + n) - B*c*f*(2 + m + n))))*(a + b*x)^{(1 + m)}*(c + d*x)^n*(e + f*x)^{(-1 - m - n)}*Hypergeometric2F1[1 + m, -n, 2 + m, -(((d*e - c*f)*(a + b*x))/((b*c - a*d)*(e + f*x)))]/((b*e - a*f)^2*(d*e - c*f)*(1 + m)*(2 + m + n)*(((b*e - a*f)*(c + d*x))/((b*c - a*d)*(e + f*x))))^n$

Rule 155

$\text{Int}[(a_. + (b_.)*(x_.))^{(m_.)}*((c_. + (d_.)*(x_.))^{(n_.)}*((e_. + (f_.)*(x_.))^{(p_.)}*((g_. + (h_.)*(x_.)), x_Symbol] := \text{Simp}[(b*g - a*h)*(a + b*x)^{(m + 1)}*(c + d*x)^{(n + 1)}*(e + f*x)^{(p + 1)}]/((m + 1)*(b*c - a*d)*(b*e - a*f)), x] + \text{Dist}[1/((m + 1)*(b*c - a*d)*(b*e - a*f)), \text{Int}[(a + b*x)^{(m + 1)}*(c + d$

```
*x)^n*(e + f*x)^p*Simp[(a*d*f*g - b*(d*e + c*f)*g + b*c*e*h)*(m + 1) - (b*g
- a*h)*(d*e*(n + 1) + c*f*(p + 1)) - d*f*(b*g - a*h)*(m + n + p + 3)*x, x]
, x], x] /; FreeQ[{a, b, c, d, e, f, g, h, n, p}, x] && ILtQ[m + n + p + 2,
0] && NeQ[m, -1] && (SumSimplerQ[m, 1] || ( !(NeQ[n, -1] && SumSimplerQ[n,
1]) && !(NeQ[p, -1] && SumSimplerQ[p, 1])))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :=> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_)] /; FreeQ[b, x]
```

Rule 132

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_)*((e_.) + (f_.)*(x_
))^(p_), x_Symbol] :=> Simp[((a + b*x)^(m + 1)*(c + d*x)^n*(e + f*x)^(p + 1)*
Hypergeometric2F1[m + 1, -n, m + 2, -(((d*e - c*f)*(a + b*x))/((b*c - a*d)*
(e + f*x)))]/(((b*e - a*f)*(m + 1))*(((b*e - a*f)*(c + d*x))/((b*c - a*d)*
(e + f*x)))^n), x] /; FreeQ[{a, b, c, d, e, f, m, n, p}, x] && EqQ[m + n +
p + 2, 0] && !IntegerQ[n]
```

Rubi steps

$$\begin{aligned} \int (a + bx)^m (A + Bx)(c + dx)^n (e + fx)^{-3-m-n} dx &= \frac{(Be - Af)(a + bx)^{1+m}(c + dx)^{1+n}(e + fx)^{-2-m-n}}{(be - af)(de - cf)(2 + m + n)} - \frac{\int (b(Bce(1 + m) + A)) (a + bx)^m (c + dx)^n (e + fx)^{-3-m-n} dx}{(be - af)(de - cf)(2 + m + n)} \\ &= \frac{(Be - Af)(a + bx)^{1+m}(c + dx)^{1+n}(e + fx)^{-2-m-n}}{(be - af)(de - cf)(2 + m + n)} - \frac{(b(Bce(1 + m) + A)) \int (a + bx)^m (c + dx)^n (e + fx)^{-3-m-n} dx}{(be - af)(de - cf)(2 + m + n)} \\ &= \frac{(Be - Af)(a + bx)^{1+m}(c + dx)^{1+n}(e + fx)^{-2-m-n}}{(be - af)(de - cf)(2 + m + n)} - \frac{(b(Bce(1 + m) + A)) \int (a + bx)^m (c + dx)^n (e + fx)^{-3-m-n} dx}{(be - af)(de - cf)(2 + m + n)} \end{aligned}$$

Mathematica [A] time = 0.31494, size = 223, normalized size = 0.85

$$\frac{(a + bx)^{m+1}(c + dx)^n(e + fx)^{-m-n-2} \left(\frac{(e+fx)\left(\frac{c+dx}{e+fx}\frac{be-af}{bc-ad}\right)^{-n}}{(m+1)(be-af)} (a(Adf(m+1)-Bcf(m+n+2)+Bde(n+1))+b(Acf(n+1)-Ade(m+n+2)+Bce(m+1))) \right)}{(m+n+2)(be-af)(de-cf)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x)^m*(A + B*x)*(c + d*x)^n*(e + f*x)^(-3 - m - n), x]
```

```
[Out] -(((a + b*x)^(1 + m)*(c + d*x)^n*(e + f*x)^(-2 - m - n)*((-B*e) + A*f)*(c + d*x) + ((b*(B*c*e*(1 + m) + A*c*f*(1 + n) - A*d*e*(2 + m + n)) + a*(A*d*f*(1 + m) + B*d*e*(1 + n) - B*c*f*(2 + m + n)))*(e + f*x)*Hypergeometric2F1[1 + m, -n, 2 + m, ((-(d*e) + c*f)*(a + b*x))/((b*c - a*d)*(e + f*x))])/((b*e - a*f)*(1 + m)*(((b*e - a*f)*(c + d*x))/((b*c - a*d)*(e + f*x)))^n))/((b*e - a*f)*(d*e - c*f)*(2 + m + n))
```

Maple [F] time = 0.151, size = 0, normalized size = 0.

$$\int (bx + a)^m (Bx + A)(dx + c)^n (fx + e)^{-3-m-n} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x+a)^m*(B*x+A)*(d*x+c)^n*(f*x+e)^(-3-m-n),x)
```

```
[Out] int((b*x+a)^m*(B*x+A)*(d*x+c)^n*(f*x+e)^(-3-m-n),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (Bx + A)(bx + a)^m(dx + c)^n(fx + e)^{-m-n-3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^m*(B*x+A)*(d*x+c)^n*(f*x+e)^(-3-m-n),x, algorithm="maxima")
```

```
[Out] integrate((B*x + A)*(b*x + a)^m*(d*x + c)^n*(f*x + e)^(-m - n - 3), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left((Bx + A)(bx + a)^m(dx + c)^n(fx + e)^{-m-n-3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^m*(B*x+A)*(d*x+c)^n*(f*x+e)^(-3-m-n),x, algorithm="fricas")
```


[Out] `integral((B*x + A)*(b*x + a)^m*(d*x + c)^n*(f*x + e)^(-m - n - 3), x)`

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((b*x+a)**m*(B*x+A)*(d*x+c)**n*(f*x+e)**(-3-m-n), x)`

[Out] Timed out

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (Bx + A)(bx + a)^m(dx + c)^n(fx + e)^{-m-n-3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((b*x+a)^m*(B*x+A)*(d*x+c)^n*(f*x+e)^(-3-m-n), x, algorithm="giac")`

[Out] `integrate((B*x + A)*(b*x + a)^m*(d*x + c)^n*(f*x + e)^(-m - n - 3), x)`

3.148 $\int (a + bx)^m (A + Bx)(c + dx)^n (e + fx)^{-4-m-n} dx$

Optimal. Leaf size=558

$$\frac{(a + bx)^{m+1}(c + dx)^n(e + fx)^{-m-n-1} \left(\frac{(c+dx)(be-af)}{(e+fx)(bc-ad)} \right)^{-n} ((m + n + 2)(bde((m + n + 3)(A(-adf - bcf + bde) + aBcf) - (Be -$$

[Out] $((B*e - A*f)*(a + b*x)^{(1 + m)*(c + d*x)^{(1 + n)*(e + f*x)^{(-3 - m - n)}})/((b*e - a*f)*(d*e - c*f)*(3 + m + n)) + ((a*f*(A*d*f*(2 + m) + B*(d*e*(1 + n) - c*f*(3 + m + n))) + b*(B*e*(d*e + c*f*(1 + m)) + A*f*(c*f*(2 + n) - d*e*(4 + m + n))))*(a + b*x)^{(1 + m)*(c + d*x)^{(1 + n)*(e + f*x)^{(-2 - m - n)}})/((b*e - a*f)^2*(d*e - c*f)^2*(2 + m + n)*(3 + m + n)) + (((2 + m + n)*(a*b*c*d*f*(B*e - A*f) + b*d*e*((a*B*c*f + A*(b*d*e - b*c*f - a*d*f)))*(3 + m + n) - (B*e - A*f)*(b*c*(1 + m) + a*d*(1 + n))) - (b*c + a*d)*f*((a*B*c*f + A*(b*d*e - b*c*f - a*d*f)))*(3 + m + n) - (B*e - A*f)*(b*c*(1 + m) + a*d*(1 + n)))) - (b*c*(1 + m) + a*d*(1 + n))*(a*f*(A*d*f*(2 + m) + B*(d*e*(1 + n) - c*f*(3 + m + n))) + b*(B*e*(d*e + c*f*(1 + m)) + A*f*(c*f*(2 + n) - d*e*(4 + m + n))))*(a + b*x)^{(1 + m)*(c + d*x)^n*(e + f*x)^{(-1 - m - n)}}*Hypergeometric2F1[1 + m, -n, 2 + m, -(((d*e - c*f)*(a + b*x))/((b*c - a*d)*(e + f*x)))]/((b*e - a*f)^3*(d*e - c*f)^2*(1 + m)*(2 + m + n)*(3 + m + n)*(((b*e - a*f)*(c + d*x))/((b*c - a*d)*(e + f*x)))^n)$

Rubi [A] time = 0.9808, antiderivative size = 558, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 34, $\frac{\text{number of rules}}{\text{integrand size}} = 0.088$, Rules used = {155, 12, 132}

$$(a + bx)^{m+1}(c + dx)^n(e + fx)^{-m-n-1} \left(\frac{(c+dx)(be-af)}{(e+fx)(bc-ad)} \right)^{-n} ((m + n + 2)(-bde(a(Adf(m + 2) - Bcf(m + n + 3) + Bde(n + 1)) +$$

Antiderivative was successfully verified.

[In] $\text{Int}[(a + b*x)^m*(A + B*x)*(c + d*x)^n*(e + f*x)^{(-4 - m - n)}, x]$

[Out] $((B*e - A*f)*(a + b*x)^{(1 + m)*(c + d*x)^{(1 + n)*(e + f*x)^{(-3 - m - n)}})/((b*e - a*f)*(d*e - c*f)*(3 + m + n)) + ((a*f*(A*d*f*(2 + m) + B*d*e*(1 + n) - B*c*f*(3 + m + n)) + b*(B*e*(d*e + c*f*(1 + m)) + A*f*(c*f*(2 + n) - d*e*(4 + m + n))))*(a + b*x)^{(1 + m)*(c + d*x)^{(1 + n)*(e + f*x)^{(-2 - m - n)}})/((b*e - a*f)^2*(d*e - c*f)^2*(2 + m + n)*(3 + m + n)) + (((2 + m + n)*(a*b*c*d*f*(B*e - A*f) - b*d*e*(b*(B*c*e*(1 + m) + A*c*f*(2 + n) - A*d*e*(3 + m + n)) + a*(A*d*f*(2 + m) + B*d*e*(1 + n) - B*c*f*(3 + m + n))) + (b*c + a*d$

```
)*f*(b*(B*c*e*(1 + m) + A*c*f*(2 + n) - A*d*e*(3 + m + n)) + a*(A*d*f*(2 +
m) + B*d*e*(1 + n) - B*c*f*(3 + m + n))) - (b*c*(1 + m) + a*d*(1 + n))*(a*
f*(A*d*f*(2 + m) + B*d*e*(1 + n) - B*c*f*(3 + m + n)) + b*(B*e*(d*e + c*f*(
1 + m)) + A*f*(c*f*(2 + n) - d*e*(4 + m + n))))*(a + b*x)^(1 + m)*(c + d*x
)^n*(e + f*x)^(-1 - m - n)*Hypergeometric2F1[1 + m, -n, 2 + m, -(((d*e - c*
f)*(a + b*x))/((b*c - a*d)*(e + f*x)))]/((b*e - a*f)^3*(d*e - c*f)^2*(1 +
m)*(2 + m + n)*(3 + m + n)*(((b*e - a*f)*(c + d*x))/((b*c - a*d)*(e + f*x)
))^n)
```

Rule 155

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_)*((e_.) + (f_.)*(x_
))^p_*(g_.) + (h_.)*(x_)), x_Symbol] := Simp[((b*g - a*h)*(a + b*x)^(m +
1)*(c + d*x)^(n + 1)*(e + f*x)^(p + 1))/((m + 1)*(b*c - a*d)*(b*e - a*f)),
x] + Dist[1/((m + 1)*(b*c - a*d)*(b*e - a*f)), Int[(a + b*x)^(m + 1)*(c + d
*x)^n*(e + f*x)^p*Simp[(a*d*f*g - b*(d*e + c*f)*g + b*c*e*h)*(m + 1) - (b*g
- a*h)*(d*e*(n + 1) + c*f*(p + 1)) - d*f*(b*g - a*h)*(m + n + p + 3)*x, x]
, x], x] /; FreeQ[{a, b, c, d, e, f, g, h, n, p}, x] && ILtQ[m + n + p + 2,
0] && NeQ[m, -1] && (SumSimplerQ[m, 1] || (!NeQ[n, -1] && SumSimplerQ[n,
1])) && !(NeQ[p, -1] && SumSimplerQ[p, 1]))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_)] /; FreeQ[b, x]
```

Rule 132

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_)*((e_.) + (f_.)*(x_
))^p_, x_Symbol] := Simp[((a + b*x)^(m + 1)*(c + d*x)^n*(e + f*x)^(p + 1)*
Hypergeometric2F1[m + 1, -n, m + 2, -(((d*e - c*f)*(a + b*x))/((b*c - a*d)*
(e + f*x)))]/(((b*e - a*f)*(m + 1))*(((b*e - a*f)*(c + d*x))/((b*c - a*d)*
(e + f*x)))^n), x] /; FreeQ[{a, b, c, d, e, f, m, n, p}, x] && EqQ[m + n +
p + 2, 0] && !IntegerQ[n]
```

Rubi steps

$$\begin{aligned}
\int (a + bx)^m (A + Bx)(c + dx)^n (e + fx)^{-4-m-n} dx &= \frac{(Be - Af)(a + bx)^{1+m}(c + dx)^{1+n}(e + fx)^{-3-m-n}}{(be - af)(de - cf)(3 + m + n)} - \frac{\int (a + bx)^m (c + dx)^n (e + fx)^{-3-m-n} dx}{(be - af)(de - cf)(3 + m + n)} \\
&= \frac{(Be - Af)(a + bx)^{1+m}(c + dx)^{1+n}(e + fx)^{-3-m-n}}{(be - af)(de - cf)(3 + m + n)} + \frac{af(Adf(2 + m) + Bde(n + 1))}{(be - af)(de - cf)(3 + m + n)} \\
&= \frac{(Be - Af)(a + bx)^{1+m}(c + dx)^{1+n}(e + fx)^{-3-m-n}}{(be - af)(de - cf)(3 + m + n)} + \frac{af(Adf(2 + m) + Bde(n + 1))}{(be - af)(de - cf)(3 + m + n)} \\
&= \frac{(Be - Af)(a + bx)^{1+m}(c + dx)^{1+n}(e + fx)^{-3-m-n}}{(be - af)(de - cf)(3 + m + n)} + \frac{af(Adf(2 + m) + Bde(n + 1))}{(be - af)(de - cf)(3 + m + n)}
\end{aligned}$$

Mathematica [A] time = 1.87166, size = 508, normalized size = 0.91

$$(a + bx)^{m+1}(c + dx)^n(e + fx)^{-m-n-3} \left(-\frac{(e+fx)^2 \left(\frac{(c+dx)(be-af)}{(e+fx)(bc-ad)} \right)^{-n} ((m+n+2)(-bde(a(Adf(m+2)-Bcf(m+n+3)+Bde(n+1))+b(Acf(n+2)-Ade(m+n+1))))}{(be-af)(de-cf)(3+m+n)} \right)$$

Antiderivative was successfully verified.

[In] Integrate[(a + b*x)^m*(A + B*x)*(c + d*x)^n*(e + f*x)^(-4 - m - n), x]

[Out] -(((a + b*x)^(1 + m)*(c + d*x)^n*(e + f*x)^(-3 - m - n)*(-(B*e - A*f)*(c + d*x)) - ((a*f*(A*d*f*(2 + m) + B*d*e*(1 + n) - B*c*f*(3 + m + n)) + b*(B*e*(d*e + c*f*(1 + m)) + A*f*(c*f*(2 + n) - d*e*(4 + m + n))))*(c + d*x)*(e + f*x))/((b*e - a*f)*(d*e - c*f)*(2 + m + n)) - (((2 + m + n)*(a*b*c*d*f*(B*e - A*f) - b*d*e*(b*(B*c*e*(1 + m) + A*c*f*(2 + n) - A*d*e*(3 + m + n)) + a*(A*d*f*(2 + m) + B*d*e*(1 + n) - B*c*f*(3 + m + n)))) + (b*c + a*d)*f*(b*(B*c*e*(1 + m) + A*c*f*(2 + n) - A*d*e*(3 + m + n)) + a*(A*d*f*(2 + m) + B*d*e*(1 + n) - B*c*f*(3 + m + n)))) - (b*c*(1 + m) + a*d*(1 + n))*(a*f*(A*d*f*(2 + m) + B*d*e*(1 + n) - B*c*f*(3 + m + n)) + b*(B*e*(d*e + c*f*(1 + m)) + A*f*(c*f*(2 + n) - d*e*(4 + m + n))))*(e + f*x)^2*Hypergeometric2F1[1 + m, -n, 2 + m, ((-d*e) + c*f)*(a + b*x))/((b*c - a*d)*(e + f*x))]/((b*e - a*f)^2*(d*e - c*f)*(1 + m)*(2 + m + n)*((b*e - a*f)*(c + d*x))/((b*c - a*d)*(e + f*x)))^n))/((b*e - a*f)*(d*e - c*f)*(3 + m + n))

Maple [F] time = 0.152, size = 0, normalized size = 0.

$$\int (bx + a)^m (Bx + A)(dx + c)^n (fx + e)^{-4-m-n} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `int((b*x+a)^m*(B*x+A)*(d*x+c)^n*(f*x+e)^(-4-m-n), x)`

[Out] `int((b*x+a)^m*(B*x+A)*(d*x+c)^n*(f*x+e)^(-4-m-n), x)`

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (Bx + A)(bx + a)^m(dx + c)^n(fx + e)^{-m-n-4} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((b*x+a)^m*(B*x+A)*(d*x+c)^n*(f*x+e)^(-4-m-n), x, algorithm="maxima")`

[Out] `integrate((B*x + A)*(b*x + a)^m*(d*x + c)^n*(f*x + e)^(-m - n - 4), x)`

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left((Bx + A)(bx + a)^m(dx + c)^n(fx + e)^{-m-n-4}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((b*x+a)^m*(B*x+A)*(d*x+c)^n*(f*x+e)^(-4-m-n), x, algorithm="fricas")`

[Out] `integral((B*x + A)*(b*x + a)^m*(d*x + c)^n*(f*x + e)^(-m - n - 4), x)`

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((b*x+a)**m*(B*x+A)*(d*x+c)**n*(f*x+e)**(-4-m-n), x)`

[Out] Timed out

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (Bx + A)(bx + a)^m(dx + c)^n(fx + e)^{-m-n-4} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b*x+a)^m*(B*x+A)*(d*x+c)^n*(f*x+e)^(-4-m-n),x, algorithm="giac")

[Out] integrate((B*x + A)*(b*x + a)^m*(d*x + c)^n*(f*x + e)^(-m - n - 4), x)

$$3.149 \quad \int \frac{x(a+bx+cx^2)}{\sqrt{1-dx}\sqrt{1+dx}} dx$$

Optimal. Leaf size=79

$$-\frac{\sqrt{1-d^2x^2}(2(3ad^2+2c)+3bd^2x)}{6d^4} + \frac{b \sin^{-1}(dx)}{2d^3} - \frac{cx^2\sqrt{1-d^2x^2}}{3d^2}$$

[Out] $-(c*x^2*\text{Sqrt}[1 - d^2*x^2])/(3*d^2) - ((2*(2*c + 3*a*d^2) + 3*b*d^2*x)*\text{Sqrt}[1 - d^2*x^2])/(6*d^4) + (b*\text{ArcSin}[d*x])/(2*d^3)$

Rubi [A] time = 0.142394, antiderivative size = 79, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}} = 0.129$, Rules used = {1609, 1809, 780, 216}

$$-\frac{\sqrt{1-d^2x^2}(2(3ad^2+2c)+3bd^2x)}{6d^4} + \frac{b \sin^{-1}(dx)}{2d^3} - \frac{cx^2\sqrt{1-d^2x^2}}{3d^2}$$

Antiderivative was successfully verified.

[In] $\text{Int}[(x*(a + b*x + c*x^2))/(\text{Sqrt}[1 - d*x]*\text{Sqrt}[1 + d*x]),x]$

[Out] $-(c*x^2*\text{Sqrt}[1 - d^2*x^2])/(3*d^2) - ((2*(2*c + 3*a*d^2) + 3*b*d^2*x)*\text{Sqrt}[1 - d^2*x^2])/(6*d^4) + (b*\text{ArcSin}[d*x])/(2*d^3)$

Rule 1609

$\text{Int}[(P_x) * ((a_{\cdot}) + (b_{\cdot})*(x_{\cdot}))^{(m_{\cdot})} * ((c_{\cdot}) + (d_{\cdot})*(x_{\cdot}))^{(n_{\cdot})} * ((e_{\cdot}) + (f_{\cdot})*(x_{\cdot}))^{(p_{\cdot})}, x_Symbol] \rightarrow \text{Int}[P_x * (a*c + b*d*x^2)^m * (e + f*x)^p, x] /;$ FreeQ[{a, b, c, d, e, f, m, n, p}, x] && PolyQ[Px, x] && EqQ[b*c + a*d, 0] && EqQ[m, n] && (IntegerQ[m] || (GtQ[a, 0] && GtQ[c, 0]))

Rule 1809

$\text{Int}[(P_q) * ((c_{\cdot})*(x_{\cdot}))^{(m_{\cdot})} * ((a_{\cdot}) + (b_{\cdot})*(x_{\cdot})^2)^{(p_{\cdot})}, x_Symbol] \rightarrow \text{With}[\{q = \text{Expon}[P_q, x], f = \text{Coeff}[P_q, x, \text{Expon}[P_q, x]]\}, \text{Simp}[(f*(c*x)^{(m+q-1)}*(a + b*x^2)^{(p+1)})/(b*c^{(q-1)}*(m+q+2*p+1)), x] + \text{Dist}[1/(b*(m+q+2*p+1)), \text{Int}[(c*x)^m*(a + b*x^2)^p * \text{ExpandToSum}[b*(m+q+2*p+1)*P_q - b*f*(m+q+2*p+1)*x^q - a*f*(m+q-1)*x^{(q-2)}, x], x], x] /;$ GtQ[q, 1] && NeQ[m+q+2*p+1, 0] /; FreeQ[{a, b, c, m, p}, x] && PolyQ[Pq, x] && (!IGtQ[m, 0] || IGtQ[p+1/2, -1])

Rule 780

```
Int[((d_.) + (e_.)*(x_))*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p_), x
_Symbol] := Simp[(((e*f + d*g)*(2*p + 3) + 2*e*g*(p + 1)*x)*(a + c*x^2)^(p
+ 1))/(2*c*(p + 1)*(2*p + 3)), x] - Dist[(a*e*g - c*d*f*(2*p + 3))/(c*(2*p
+ 3)), Int[(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, f, g, p}, x] && !Le
Q[p, -1]
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] := Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rubi steps

$$\begin{aligned} \int \frac{x(a + bx + cx^2)}{\sqrt{1 - dx}\sqrt{1 + dx}} dx &= \int \frac{x(a + bx + cx^2)}{\sqrt{1 - d^2x^2}} dx \\ &= -\frac{cx^2\sqrt{1 - d^2x^2}}{3d^2} - \frac{\int \frac{x(-2c - 3ad^2 - 3bd^2x)}{\sqrt{1 - d^2x^2}} dx}{3d^2} \\ &= -\frac{cx^2\sqrt{1 - d^2x^2}}{3d^2} - \frac{(2(2c + 3ad^2) + 3bd^2x)\sqrt{1 - d^2x^2}}{6d^4} + \frac{b \int \frac{1}{\sqrt{1 - d^2x^2}} dx}{2d^2} \\ &= -\frac{cx^2\sqrt{1 - d^2x^2}}{3d^2} - \frac{(2(2c + 3ad^2) + 3bd^2x)\sqrt{1 - d^2x^2}}{6d^4} + \frac{b \sin^{-1}(dx)}{2d^3} \end{aligned}$$

Mathematica [A] time = 0.0619055, size = 57, normalized size = 0.72

$$\frac{3bd \sin^{-1}(dx) - \sqrt{1 - d^2x^2} (3d^2(2a + bx) + 2c(d^2x^2 + 2))}{6d^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*(a + b*x + c*x^2))/(Sqrt[1 - d*x]*Sqrt[1 + d*x]),x]
```

```
[Out] (-(Sqrt[1 - d^2*x^2]*(3*d^2*(2*a + b*x) + 2*c*(2 + d^2*x^2))) + 3*b*d*ArcSi
n[d*x])/(6*d^4)
```


Maple [C] time = 0.038, size = 139, normalized size = 1.8

$$-\frac{\operatorname{csgn}(d)}{6d^4} \sqrt{-dx+1} \sqrt{dx+1} \left(2 \operatorname{csgn}(d) x^2 c d^2 \sqrt{-d^2 x^2 + 1} + 3 \sqrt{-d^2 x^2 + 1} \operatorname{csgn}(d) x b d^2 + 6 \operatorname{csgn}(d) \sqrt{-d^2 x^2 + 1} a d^2 + 4 \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `int(x*(c*x^2+b*x+a)/(-d*x+1)^(1/2)/(d*x+1)^(1/2),x)`

[Out] $-1/6*(-d*x+1)^{(1/2)}*(d*x+1)^{(1/2)}*(2*\operatorname{csgn}(d)*x^2*c*d^2*(-d^2*x^2+1)^{(1/2)}+3*(-d^2*x^2+1)^{(1/2)}*\operatorname{csgn}(d)*x*b*d^2+6*\operatorname{csgn}(d)*(-d^2*x^2+1)^{(1/2)}*a*d^2+4*\operatorname{csgn}(d)*(-d^2*x^2+1)^{(1/2)}*c-3*\arctan(\operatorname{csgn}(d)*d*x/(-d^2*x^2+1)^{(1/2)})*b*d)*\operatorname{csgn}(d)/d^4/(-d^2*x^2+1)^{(1/2)}$

Maxima [A] time = 3.06815, size = 134, normalized size = 1.7

$$-\frac{\sqrt{-d^2 x^2 + 1} c x^2}{3 d^2} - \frac{\sqrt{-d^2 x^2 + 1} b x}{2 d^2} - \frac{\sqrt{-d^2 x^2 + 1} a}{d^2} + \frac{b \arcsin\left(\frac{d^2 x}{\sqrt{d^2}}\right)}{2 \sqrt{d^2} d^2} - \frac{2 \sqrt{-d^2 x^2 + 1} c}{3 d^4}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate(x*(c*x^2+b*x+a)/(-d*x+1)^(1/2)/(d*x+1)^(1/2),x, algorithm="maxima")`

[Out] $-1/3*\sqrt{-d^2*x^2+1}*c*x^2/d^2 - 1/2*\sqrt{-d^2*x^2+1}*b*x/d^2 - \sqrt{-d^2*x^2+1}*a/d^2 + 1/2*b*\arcsin(d^2*x/\sqrt{d^2})/(\sqrt{d^2}*d^2) - 2/3*\sqrt{-d^2*x^2+1}*c/d^4$

Fricas [A] time = 1.04654, size = 189, normalized size = 2.39

$$-\frac{6 b d \arctan\left(\frac{\sqrt{d x+1} \sqrt{-d x+1}-1}{d x}\right) + (2 c d^2 x^2 + 3 b d^2 x + 6 a d^2 + 4 c) \sqrt{d x+1} \sqrt{-d x+1}}{6 d^4}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate(x*(c*x^2+b*x+a)/(-d*x+1)^(1/2)/(d*x+1)^(1/2),x, algorithm="fricas")`

[Out] $-1/6*(6*b*d*\arctan((\sqrt{d*x + 1})*\sqrt{-d*x + 1} - 1)/(d*x)) + (2*c*d^2*x^2 + 3*b*d^2*x + 6*a*d^2 + 4*c)*\sqrt{d*x + 1}*\sqrt{-d*x + 1})/d^4$

Sympy [C] time = 46.1254, size = 313, normalized size = 3.96

$$\frac{iaG_{6,6}^{6,2}\left(-\frac{1}{2}, -\frac{1}{4}, 0, \frac{1}{4}, \frac{1}{2}, 0, 0, 0, \frac{1}{2}, 1 \left| \frac{1}{d^2x^2} \right. \right)}{4\pi^{\frac{3}{2}}d^2} - \frac{aG_{6,6}^{2,6}\left(-1, -\frac{3}{4}, -\frac{1}{2}, -\frac{1}{4}, 0, 1, -\frac{3}{4}, -\frac{1}{4}, -1, -\frac{1}{2}, -\frac{1}{2}, 0 \left| \frac{e^{-2i\pi}}{d^2x^2} \right. \right)}{4\pi^{\frac{3}{2}}d^2} - \frac{ibG_{6,6}^{6,2}\left(-1, -\frac{3}{4}, -\frac{1}{2}, -\frac{1}{4}, 0, 0, 0, 0, \frac{1}{2}, 1 \left| \frac{1}{d^2x^2} \right. \right)}{4\pi^{\frac{3}{2}}d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate(x*(c*x**2+b*x+a)/(-d*x+1)**(1/2)/(d*x+1)**(1/2),x)`

[Out] $-I*a*\text{meijerg}(((-1/4, 1/4), (0, 0, 1/2, 1)), ((-1/2, -1/4, 0, 1/4, 1/2, 0), ()), 1/(d**2*x**2))/(4*pi**(3/2)*d**2) - a*\text{meijerg}(((-1, -3/4, -1/2, -1/4, 0, 1), ()), ((-3/4, -1/4), (-1, -1/2, -1/2, 0)), \text{exp_polar}(-2*I*pi)/(d**2*x**2))/(4*pi**(3/2)*d**2) - I*b*\text{meijerg}(((-3/4, -1/4), (-1/2, -1/2, 0, 1)), ((-1, -3/4, -1/2, -1/4, 0, 0), ()), 1/(d**2*x**2))/(4*pi**(3/2)*d**3) + b*m\text{eijerg}(((-3/2, -5/4, -1, -3/4, -1/2, 1), ()), ((-5/4, -3/4), (-3/2, -1, -1, 0)), \text{exp_polar}(-2*I*pi)/(d**2*x**2))/(4*pi**(3/2)*d**3) - I*c*\text{meijerg}(((-5/4, -3/4), (-1, -1, -1/2, 1)), ((-3/2, -5/4, -1, -3/4, -1/2, 0), ()), 1/(d**2*x**2))/(4*pi**(3/2)*d**4) - c*\text{meijerg}(((-2, -7/4, -3/2, -5/4, -1, 1), ()), ((-7/4, -5/4), (-2, -3/2, -3/2, 0)), \text{exp_polar}(-2*I*pi)/(d**2*x**2))/(4*pi**(3/2)*d**4)$

Giac [A] time = 2.05163, size = 123, normalized size = 1.56

$$\frac{6bd^{10} \arcsin\left(\frac{1}{2}\sqrt{2}\sqrt{dx+1}\right) - (6ad^{11} - 3bd^{10} + 6cd^9 + (2(dx+1)cd^9 + 3bd^{10} - 4cd^9)(dx+1))\sqrt{dx+1}\sqrt{-dx+1}}{3840d}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate(x*(c*x^2+b*x+a)/(-d*x+1)^(1/2)/(d*x+1)^(1/2),x, algorithm="giac")`

[Out] $1/3840*(6*b*d^10*\arcsin(1/2*\sqrt{2}*\sqrt{d*x + 1})) - (6*a*d^11 - 3*b*d^10 + 6*c*d^9 + (2*(d*x + 1)*c*d^9 + 3*b*d^10 - 4*c*d^9)*(d*x + 1))*\sqrt{d*x + 1}*\sqrt{-d*x + 1})/d$

$$3.150 \quad \int \frac{a+bx+cx^2}{\sqrt{1-dx}\sqrt{1+dx}} dx$$

Optimal. Leaf size=63

$$\frac{(2ad^2 + c) \sin^{-1}(dx)}{2d^3} - \frac{b\sqrt{1-d^2x^2}}{d^2} - \frac{cx\sqrt{1-d^2x^2}}{2d^2}$$

[Out] $-\left(\frac{b\sqrt{1-d^2x^2}}{d^2}\right) - \frac{cx\sqrt{1-d^2x^2}}{2d^2} + \frac{(c+2a\sqrt{1-d^2x^2})\text{ArcSin}[dx]}{2d^3}$

Rubi [A] time = 0.0613671, antiderivative size = 63, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$, Rules used = {899, 1815, 641, 216}

$$\frac{(2ad^2 + c) \sin^{-1}(dx)}{2d^3} - \frac{b\sqrt{1-d^2x^2}}{d^2} - \frac{cx\sqrt{1-d^2x^2}}{2d^2}$$

Antiderivative was successfully verified.

[In] Int[(a + b*x + c*x^2)/(Sqrt[1 - d*x]*Sqrt[1 + d*x]), x]

[Out] $-\left(\frac{b\sqrt{1-d^2x^2}}{d^2}\right) - \frac{cx\sqrt{1-d^2x^2}}{2d^2} + \frac{(c+2a\sqrt{1-d^2x^2})\text{ArcSin}[dx]}{2d^3}$

Rule 899

Int[((d_) + (e_)*(x_)^(m_))*((f_) + (g_)*(x_)^(n_))*((a_) + (b_)*(x_) + (c_)*(x_)^2)^(p_), x_Symbol] := Int[(d*f + e*g*x^2)^m*(a + b*x + c*x^2)^p, x] /; FreeQ[{a, b, c, d, e, f, g, m, n, p}, x] && EqQ[m - n, 0] && EqQ[e*f + d*g, 0] && (IntegerQ[m] || (GtQ[d, 0] && GtQ[f, 0]))

Rule 1815

Int[(Pq_)*((a_) + (b_)*(x_)^2)^(p_), x_Symbol] := With[{q = Expon[Pq, x], e = Coeff[Pq, x, Expon[Pq, x]]}, Simp[(e*x^(q-1)*(a + b*x^2)^(p+1))/(b*(q+2*p+1)), x] + Dist[1/(b*(q+2*p+1)), Int[(a + b*x^2)^p*ExpandToSum[b*(q+2*p+1)*Pq - a*e*(q-1)*x^(q-2) - b*e*(q+2*p+1)*x^q, x], x] /; FreeQ[{a, b, p}, x] && PolyQ[Pq, x] && !LeQ[p, -1]

Rule 641

```
Int[((d_) + (e_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] := Simp[(e*(
a + c*x^2)^(p + 1))/(2*c*(p + 1)), x] + Dist[d, Int[(a + c*x^2)^p, x], x] /
; FreeQ[{a, c, d, e, p}, x] && NeQ[p, -1]
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] := Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rubi steps

$$\begin{aligned} \int \frac{a + bx + cx^2}{\sqrt{1 - dx}\sqrt{1 + dx}} dx &= \int \frac{a + bx + cx^2}{\sqrt{1 - d^2x^2}} dx \\ &= -\frac{cx\sqrt{1 - d^2x^2}}{2d^2} - \frac{\int \frac{-c - 2ad^2 - 2bd^2x}{\sqrt{1 - d^2x^2}} dx}{2d^2} \\ &= -\frac{b\sqrt{1 - d^2x^2}}{d^2} - \frac{cx\sqrt{1 - d^2x^2}}{2d^2} - \frac{(-c - 2ad^2) \int \frac{1}{\sqrt{1 - d^2x^2}} dx}{2d^2} \\ &= -\frac{b\sqrt{1 - d^2x^2}}{d^2} - \frac{cx\sqrt{1 - d^2x^2}}{2d^2} + \frac{(c + 2ad^2) \sin^{-1}(dx)}{2d^3} \end{aligned}$$

Mathematica [A] time = 0.0308813, size = 45, normalized size = 0.71

$$\frac{(2ad^2 + c) \sin^{-1}(dx) - d\sqrt{1 - d^2x^2}(2b + cx)}{2d^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x + c*x^2)/(Sqrt[1 - d*x]*Sqrt[1 + d*x]), x]
```

```
[Out] (-(d*(2*b + c*x)*Sqrt[1 - d^2*x^2]) + (c + 2*a*d^2)*ArcSin[d*x])/(2*d^3)
```

Maple [C] time = 0.015, size = 117, normalized size = 1.9

$$-\frac{\operatorname{csgn}(d)}{2d^3} \sqrt{-dx + 1} \sqrt{dx + 1} \left(\operatorname{csgn}(d) d \sqrt{-d^2x^2 + 1} xc - 2 \arctan\left(\frac{\operatorname{csgn}(d) dx}{\sqrt{-d^2x^2 + 1}}\right) ad^2 + 2 \operatorname{csgn}(d) d \sqrt{-d^2x^2 + 1} b - \arctan\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `int((c*x^2+b*x+a)/(-d*x+1)^(1/2)/(d*x+1)^(1/2),x)`

[Out] $-1/2*(-d*x+1)^{(1/2)}*(d*x+1)^{(1/2)}/d^3*(\text{csgn}(d)*d*(-d^2*x^2+1)^{(1/2)}*x*c-2*a$
 $\text{rctan}(\text{csgn}(d)*d*x/(-d^2*x^2+1)^{(1/2)})*a*d^2+2*\text{csgn}(d)*d*(-d^2*x^2+1)^{(1/2)}*$
 $b-\text{arctan}(\text{csgn}(d)*d*x/(-d^2*x^2+1)^{(1/2)})*c)/(-d^2*x^2+1)^{(1/2)}*\text{csgn}(d)$

Maxima [A] time = 4.26123, size = 105, normalized size = 1.67

$$\frac{a \arcsin\left(\frac{d^2x}{\sqrt{d^2}}\right)}{\sqrt{d^2}} - \frac{\sqrt{-d^2x^2+1}cx}{2d^2} - \frac{\sqrt{-d^2x^2+1}b}{d^2} + \frac{c \arcsin\left(\frac{d^2x}{\sqrt{d^2}}\right)}{2\sqrt{d^2}d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((c*x^2+b*x+a)/(-d*x+1)^(1/2)/(d*x+1)^(1/2),x, algorithm="maxima")`

[Out] $a*\arcsin(d^2*x/\text{sqrt}(d^2))/\text{sqrt}(d^2) - 1/2*\text{sqrt}(-d^2*x^2 + 1)*c*x/d^2 - \text{sqrt}$
 $(-d^2*x^2 + 1)*b/d^2 + 1/2*c*\arcsin(d^2*x/\text{sqrt}(d^2))/(\text{sqrt}(d^2)*d^2)$

Fricas [A] time = 1.04267, size = 167, normalized size = 2.65

$$\frac{(cdx + 2bd)\sqrt{dx+1}\sqrt{-dx+1} + 2(2ad^2 + c)\arctan\left(\frac{\sqrt{dx+1}\sqrt{-dx+1}-1}{dx}\right)}{2d^3}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((c*x^2+b*x+a)/(-d*x+1)^(1/2)/(d*x+1)^(1/2),x, algorithm="fricas")`

[Out] $-1/2*((c*d*x + 2*b*d)*\text{sqrt}(d*x + 1)*\text{sqrt}(-d*x + 1) + 2*(2*a*d^2 + c)*\arctan$
 $((\text{sqrt}(d*x + 1)*\text{sqrt}(-d*x + 1) - 1)/(d*x)))/d^3$

Sympy [C] time = 21.0093, size = 282, normalized size = 4.48

$$\frac{iaG_{6,6}^{6,2}\left(0, \frac{1}{4}, \frac{1}{2}, \frac{3}{4}, 1, 0 \left| \frac{1}{d^2x^2} \right.\right)}{4\pi^{\frac{3}{2}}d} + \frac{aG_{6,6}^{2,6}\left(-\frac{1}{2}, -\frac{1}{4}, 0, \frac{1}{4}, \frac{1}{2}, 1 \left| \frac{e^{-2i\pi}}{d^2x^2} \right.\right)}{4\pi^{\frac{3}{2}}d} - \frac{ibG_{6,6}^{6,2}\left(-\frac{1}{2}, -\frac{1}{4}, 0, \frac{1}{4}, \frac{1}{2}, 0 \left| 0, 0, \frac{1}{2} \right.\right)}{4\pi^{\frac{3}{2}}d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((c*x**2+b*x+a)/(-d*x+1)**(1/2)/(d*x+1)**(1/2),x)

[Out] $-I*a*\text{meijerg}(((1/4, 3/4), (1/2, 1/2, 1, 1)), ((0, 1/4, 1/2, 3/4, 1, 0), ()), 1/(d**2*x**2))/(4*pi**(3/2)*d) + a*\text{meijerg}((-1/2, -1/4, 0, 1/4, 1/2, 1), ((-1/4, 1/4), (-1/2, 0, 0, 0)), \exp_polar(-2*I*pi)/(d**2*x**2))/(4*pi**(3/2)*d) - I*b*\text{meijerg}((-1/4, 1/4), (0, 0, 1/2, 1)), ((-1/2, -1/4, 0, 1/4, 1/2, 0), ()), 1/(d**2*x**2))/(4*pi**(3/2)*d**2) - b*\text{meijerg}((-1, -3/4, -1/2, -1/4, 0, 1), ((-3/4, -1/4), (-1, -1/2, -1/2, 0)), \exp_polar(-2*I*pi)/(d**2*x**2))/(4*pi**(3/2)*d**2) - I*c*\text{meijerg}((-3/4, -1/4), (-1/2, -1/2, 0, 1)), ((-1, -3/4, -1/2, -1/4, 0, 0), ()), 1/(d**2*x**2))/(4*pi**(3/2)*d**3) + c*\text{meijerg}((-3/2, -5/4, -1, -3/4, -1/2, 1), ((-5/4, -3/4), (-3/2, -1, -1, 0)), \exp_polar(-2*I*pi)/(d**2*x**2))/(4*pi**(3/2)*d**3)$

Giac [A] time = 2.57145, size = 97, normalized size = 1.54

$$\frac{((dx + 1)cd^4 + 2bd^5 - cd^4)\sqrt{dx + 1}\sqrt{-dx + 1} - 2(2ad^6 + cd^4)\arcsin\left(\frac{1}{2}\sqrt{2}\sqrt{dx + 1}\right)}{192d}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((c*x^2+b*x+a)/(-d*x+1)^(1/2)/(d*x+1)^(1/2),x, algorithm="giac")

[Out] $-1/192*(((d*x + 1)*c*d^4 + 2*b*d^5 - c*d^4)*\text{sqrt}(d*x + 1)*\text{sqrt}(-d*x + 1) - 2*(2*a*d^6 + c*d^4)*\arcsin(1/2*\text{sqrt}(2)*\text{sqrt}(d*x + 1)))/d$

$$3.151 \quad \int \frac{a+bx+cx^2}{x\sqrt{1-dx}\sqrt{1+dx}} dx$$

Optimal. Leaf size=48

$$-a \tanh^{-1}\left(\sqrt{1-d^2x^2}\right) + \frac{b \sin^{-1}(dx)}{d} - \frac{c\sqrt{1-d^2x^2}}{d^2}$$

[Out] -((c*Sqrt[1 - d^2*x^2])/d^2) + (b*ArcSin[d*x])/d - a*ArcTanh[Sqrt[1 - d^2*x^2]]

Rubi [A] time = 0.184023, antiderivative size = 48, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}} = 0.212$, Rules used = {1609, 1809, 844, 216, 266, 63, 208}

$$-a \tanh^{-1}\left(\sqrt{1-d^2x^2}\right) + \frac{b \sin^{-1}(dx)}{d} - \frac{c\sqrt{1-d^2x^2}}{d^2}$$

Antiderivative was successfully verified.

[In] Int[(a + b*x + c*x^2)/(x*Sqrt[1 - d*x]*Sqrt[1 + d*x]),x]

[Out] -((c*Sqrt[1 - d^2*x^2])/d^2) + (b*ArcSin[d*x])/d - a*ArcTanh[Sqrt[1 - d^2*x^2]]

Rule 1609

Int[(Px_)*((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p_.), x_Symbol] :> Int[Px*(a*c + b*d*x^2)^m*(e + f*x)^p, x] /; FreeQ[{a, b, c, d, e, f, m, n, p}, x] && PolyQ[Px, x] && EqQ[b*c + a*d, 0] && EqQ[m, n] && (IntegerQ[m] || (GtQ[a, 0] && GtQ[c, 0]))

Rule 1809

Int[(Pq_)*((c_.)*(x_))^(m_.)*((a_.) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> With[{q = Expon[Pq, x], f = Coeff[Pq, x, Expon[Pq, x]]}, Simp[(f*(c*x)^(m + q - 1)*(a + b*x^2)^(p + 1))/(b*c^(q - 1)*(m + q + 2*p + 1)), x] + Dist[1/(b*(m + q + 2*p + 1)), Int[(c*x)^m*(a + b*x^2)^p*ExpandToSum[b*(m + q + 2*p + 1)*Pq - b*f*(m + q + 2*p + 1)*x^q - a*f*(m + q - 1)*x^(q - 2), x], x], x] /; GtQ[q, 1] && NeQ[m + q + 2*p + 1, 0] /; FreeQ[{a, b, c, m, p}, x] && PolyQ[Pq, x] && (!IGtQ[m, 0] || IGtQ[p + 1/2, -1])

Rule 844

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] := Dist[g/e, Int[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] + D
ist[(e*f - d*g)/e, Int[(d + e*x)^m*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d,
e, f, g, m, p}, x] && NeQ[c*d^2 + a*e^2, 0] && !IGtQ[m, 0]
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] := Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] := Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] := With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] := Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rubi steps

$$\begin{aligned}
\int \frac{a + bx + cx^2}{x\sqrt{1-dx}\sqrt{1+dx}} dx &= \int \frac{a + bx + cx^2}{x\sqrt{1-d^2x^2}} dx \\
&= -\frac{c\sqrt{1-d^2x^2}}{d^2} - \frac{\int \frac{-ad^2-bd^2x}{x\sqrt{1-d^2x^2}} dx}{d^2} \\
&= -\frac{c\sqrt{1-d^2x^2}}{d^2} + a \int \frac{1}{x\sqrt{1-d^2x^2}} dx + b \int \frac{1}{\sqrt{1-d^2x^2}} dx \\
&= -\frac{c\sqrt{1-d^2x^2}}{d^2} + \frac{b \sin^{-1}(dx)}{d} + \frac{1}{2}a \operatorname{Subst} \left(\int \frac{1}{x\sqrt{1-d^2x}} dx, x, x^2 \right) \\
&= -\frac{c\sqrt{1-d^2x^2}}{d^2} + \frac{b \sin^{-1}(dx)}{d} - \frac{a \operatorname{Subst} \left(\int \frac{1}{\frac{1}{d^2} - \frac{x^2}{d^2}} dx, x, \sqrt{1-d^2x^2} \right)}{d^2} \\
&= -\frac{c\sqrt{1-d^2x^2}}{d^2} + \frac{b \sin^{-1}(dx)}{d} - a \tanh^{-1} \left(\sqrt{1-d^2x^2} \right)
\end{aligned}$$

Mathematica [A] time = 0.0497883, size = 48, normalized size = 1.

$$-a \tanh^{-1} \left(\sqrt{1-d^2x^2} \right) + \frac{b \sin^{-1}(dx)}{d} - \frac{c\sqrt{1-d^2x^2}}{d^2}$$

Antiderivative was successfully verified.

[In] Integrate[(a + b*x + c*x^2)/(x*Sqrt[1 - d*x]*Sqrt[1 + d*x]),x]

[Out] -((c*Sqrt[1 - d^2*x^2])/d^2) + (b*ArcSin[d*x])/d - a*ArcTanh[Sqrt[1 - d^2*x^2]]

Maple [C] time = 0.024, size = 96, normalized size = 2.

$$\frac{\operatorname{csgn}(d)}{d^2} \left(-\operatorname{csgn}(d) \operatorname{Arctanh} \left(\frac{1}{\sqrt{-d^2x^2+1}} \right) ad^2 - \operatorname{csgn}(d) \sqrt{-d^2x^2+1}c + \arctan \left(\operatorname{csgn}(d) dx \frac{1}{\sqrt{-(dx+1)(dx-1)}} \right) \right) bd$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((c*x^2+b*x+a)/x/(-d*x+1)^(1/2)/(d*x+1)^(1/2),x)

[Out] $(-\text{csgn}(d) \cdot \text{arctanh}(1/(-d^2x^2+1)^{1/2})) \cdot a \cdot d^2 - \text{csgn}(d) \cdot (-d^2x^2+1)^{1/2} \cdot c + \text{arctan}(\text{csgn}(d) \cdot dx/(-(dx+1) \cdot (dx-1))^{1/2}) \cdot b \cdot d \cdot (-dx+1)^{1/2} \cdot (dx+1)^{1/2} / d^2 \cdot \text{csgn}(d) / (-d^2x^2+1)^{1/2}$

Maxima [A] time = 3.42336, size = 89, normalized size = 1.85

$$-a \log\left(\frac{2\sqrt{-d^2x^2+1}}{|x|} + \frac{2}{|x|}\right) + \frac{b \arcsin\left(\frac{d^2x}{\sqrt{d^2}}\right)}{\sqrt{d^2}} - \frac{\sqrt{-d^2x^2+1}c}{d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((c*x^2+b*x+a)/x/(-d*x+1)^(1/2)/(d*x+1)^(1/2),x, algorithm="maxima")`

[Out] $-a \cdot \log(2 \cdot \sqrt{-d^2x^2+1} / \text{abs}(x) + 2 / \text{abs}(x)) + b \cdot \arcsin(d^2x / \sqrt{d^2}) / \sqrt{d^2} - \sqrt{-d^2x^2+1} \cdot c / d^2$

Fricas [A] time = 1.14236, size = 196, normalized size = 4.08

$$\frac{ad^2 \log\left(\frac{\sqrt{dx+1}\sqrt{-dx+1}-1}{x}\right) - 2bd \arctan\left(\frac{\sqrt{dx+1}\sqrt{-dx+1}-1}{dx}\right) - \sqrt{dx+1}\sqrt{-dx+1}c}{d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((c*x^2+b*x+a)/x/(-d*x+1)^(1/2)/(d*x+1)^(1/2),x, algorithm="fricas")`

[Out] $(a \cdot d^2 \cdot \log((\sqrt{dx+1} \cdot \sqrt{-dx+1} - 1) / x) - 2 \cdot b \cdot d \cdot \arctan((\sqrt{dx+1} \cdot \sqrt{-dx+1} - 1) / dx) - \sqrt{dx+1} \cdot \sqrt{-dx+1} \cdot c) / d^2$

Sympy [C] time = 27.8669, size = 245, normalized size = 5.1

$$\frac{iaG_{6,6}^{5,3}\left(\frac{3}{4}, \frac{5}{4}, 1, 1, 1, \frac{3}{2} \middle| \frac{1}{d^2x^2}\right)}{4\pi^2} - \frac{aG_{6,6}^{2,6}\left(0, \frac{1}{4}, \frac{1}{2}, \frac{3}{4}, 1, 1, 0, \frac{1}{2}, \frac{1}{2}, 0 \middle| \frac{e^{-2i\pi}}{d^2x^2}\right)}{4\pi^2} - \frac{ibG_{6,6}^{6,2}\left(0, \frac{1}{4}, \frac{1}{2}, \frac{3}{4}, 1, 0, \frac{1}{2}, \frac{1}{2}, 1, 1 \middle| \frac{1}{d^2x^2}\right)}{4\pi^2 d} + \frac{bG_{6,6}^{2,6}}{4\pi^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*x**2+b*x+a)/x/(-d*x+1)**(1/2)/(d*x+1)**(1/2),x)
```

```
[Out] I*a*meijerg(((3/4, 5/4, 1), (1, 1, 3/2)), ((1/2, 3/4, 1, 5/4, 3/2), (0,)),
1/(d**2*x**2))/(4*pi**(3/2)) - a*meijerg(((0, 1/4, 1/2, 3/4, 1, 1), ()), ((
1/4, 3/4), (0, 1/2, 1/2, 0)), exp_polar(-2*I*pi)/(d**2*x**2))/(4*pi**(3/2))
- I*b*meijerg(((1/4, 3/4), (1/2, 1/2, 1, 1)), ((0, 1/4, 1/2, 3/4, 1, 0), (
)), 1/(d**2*x**2))/(4*pi**(3/2)*d) + b*meijerg(((1/2, -1/4, 0, 1/4, 1/2, 1
), ()), ((-1/4, 1/4), (-1/2, 0, 0, 0)), exp_polar(-2*I*pi)/(d**2*x**2))/(4*
pi**(3/2)*d) - I*c*meijerg(((1/4, 1/4), (0, 0, 1/2, 1)), ((-1/2, -1/4, 0,
1/4, 1/2, 0), ()), 1/(d**2*x**2))/(4*pi**(3/2)*d**2) - c*meijerg(((1, -3/4
, -1/2, -1/4, 0, 1), ()), ((-3/4, -1/4), (-1, -1/2, -1/2, 0)), exp_polar(-2
*I*pi)/(d**2*x**2))/(4*pi**(3/2)*d**2)
```

Giac [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: NotImplementedError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*x^2+b*x+a)/x/(-d*x+1)^(1/2)/(d*x+1)^(1/2),x, algorithm="giac")
```

```
[Out] Exception raised: NotImplementedError
```

$$3.152 \quad \int \frac{a+bx+cx^2}{x^2\sqrt{1-dx}\sqrt{1+dx}} dx$$

Optimal. Leaf size=48

$$-\frac{a\sqrt{1-d^2x^2}}{x} - b \tanh^{-1}\left(\sqrt{1-d^2x^2}\right) + \frac{c \sin^{-1}(dx)}{d}$$

[Out] -((a*Sqrt[1 - d^2*x^2])/x) + (c*ArcSin[d*x])/d - b*ArcTanh[Sqrt[1 - d^2*x^2]]

Rubi [A] time = 0.183313, antiderivative size = 48, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}} = 0.212$, Rules used = {1609, 1807, 844, 216, 266, 63, 208}

$$-\frac{a\sqrt{1-d^2x^2}}{x} - b \tanh^{-1}\left(\sqrt{1-d^2x^2}\right) + \frac{c \sin^{-1}(dx)}{d}$$

Antiderivative was successfully verified.

[In] Int[(a + b*x + c*x^2)/(x^2*Sqrt[1 - d*x]*Sqrt[1 + d*x]),x]

[Out] -((a*Sqrt[1 - d^2*x^2])/x) + (c*ArcSin[d*x])/d - b*ArcTanh[Sqrt[1 - d^2*x^2]]

Rule 1609

Int[(Px_)*((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p_.), x_Symbol] :> Int[Px*(a*c + b*d*x^2)^m*(e + f*x)^p, x] /; FreeQ[{a, b, c, d, e, f, m, n, p}, x] && PolyQ[Px, x] && EqQ[b*c + a*d, 0] && EqQ[m, n] && (IntegerQ[m] || (GtQ[a, 0] && GtQ[c, 0]))

Rule 1807

Int[(Pq_)*((c_.)*(x_))^(m_.)*((a_.) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> With[{Q = PolynomialQuotient[Pq, c*x, x], R = PolynomialRemainder[Pq, c*x, x]}, Simp[(R*(c*x)^(m + 1)*(a + b*x^2)^(p + 1))/(a*c*(m + 1)), x] + Dist[1/(a*c*(m + 1)), Int[(c*x)^(m + 1)*(a + b*x^2)^p*ExpandToSum[a*c*(m + 1)*Q - b*R*(m + 2*p + 3)*x, x], x] /; FreeQ[{a, b, c, p}, x] && PolyQ[Pq, x] && LtQ[m, -1] && (IntegerQ[2*p] || NeQ[Expon[Pq, x], 1])

Rule 844

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] := Dist[g/e, Int[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] + D
ist[(e*f - d*g)/e, Int[(d + e*x)^m*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d,
e, f, g, m, p}, x] && NeQ[c*d^2 + a*e^2, 0] && !IGtQ[m, 0]
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] := Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] := Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_)^(n_)), x_Symbol] := With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] := Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rubi steps

$$\begin{aligned}
\int \frac{a + bx + cx^2}{x^2 \sqrt{1 - dx} \sqrt{1 + dx}} dx &= \int \frac{a + bx + cx^2}{x^2 \sqrt{1 - d^2 x^2}} dx \\
&= -\frac{a \sqrt{1 - d^2 x^2}}{x} - \int \frac{-b - cx}{x \sqrt{1 - d^2 x^2}} dx \\
&= -\frac{a \sqrt{1 - d^2 x^2}}{x} + b \int \frac{1}{x \sqrt{1 - d^2 x^2}} dx + c \int \frac{1}{\sqrt{1 - d^2 x^2}} dx \\
&= -\frac{a \sqrt{1 - d^2 x^2}}{x} + \frac{c \sin^{-1}(dx)}{d} + \frac{1}{2} b \text{Subst} \left(\int \frac{1}{x \sqrt{1 - d^2 x}} dx, x, x^2 \right) \\
&= -\frac{a \sqrt{1 - d^2 x^2}}{x} + \frac{c \sin^{-1}(dx)}{d} - \frac{b \text{Subst} \left(\int \frac{1}{\frac{1}{d^2} \frac{x^2}{d^2}} dx, x, \sqrt{1 - d^2 x^2} \right)}{d^2} \\
&= -\frac{a \sqrt{1 - d^2 x^2}}{x} + \frac{c \sin^{-1}(dx)}{d} - b \tanh^{-1} \left(\sqrt{1 - d^2 x^2} \right)
\end{aligned}$$

Mathematica [A] time = 0.054571, size = 48, normalized size = 1.

$$-\frac{a \sqrt{1 - d^2 x^2}}{x} - b \tanh^{-1} \left(\sqrt{1 - d^2 x^2} \right) + \frac{c \sin^{-1}(dx)}{d}$$

Antiderivative was successfully verified.

[In] Integrate[(a + b*x + c*x^2)/(x^2*Sqrt[1 - d*x]*Sqrt[1 + d*x]),x]

[Out] -((a*Sqrt[1 - d^2*x^2])/x) + (c*ArcSin[d*x])/d - b*ArcTanh[Sqrt[1 - d^2*x^2]]

Maple [C] time = 0.02, size = 97, normalized size = 2.

$$\frac{\text{csgn}(d)}{dx} \left(-\text{Artanh} \left(\frac{1}{\sqrt{-d^2 x^2 + 1}} \right) \text{csgn}(d) dx b - \text{csgn}(d) d \sqrt{-d^2 x^2 + 1} a + \arctan \left(\text{csgn}(d) dx \frac{1}{\sqrt{-d^2 x^2 + 1}} \right) xc \right) \sqrt{-dx}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((c*x^2+b*x+a)/x^2/(-d*x+1)^(1/2)/(d*x+1)^(1/2),x)

[Out] (-arctanh(1/(-d^2*x^2+1)^(1/2))*csgn(d)*d*x*b-csgn(d)*d*(-d^2*x^2+1)^(1/2)*a+arctan(csgn(d)*d*x/(-d^2*x^2+1)^(1/2))*x*c)*(-d*x+1)^(1/2)*(d*x+1)^(1/2)*

$\text{csgn}(d)/(-d^2x^2+1)^{(1/2)}/d/x$

Maxima [A] time = 3.04543, size = 89, normalized size = 1.85

$$-b \log\left(\frac{2\sqrt{-d^2x^2+1}}{|x|} + \frac{2}{|x|}\right) + \frac{c \arcsin\left(\frac{d^2x}{\sqrt{d^2}}\right)}{\sqrt{d^2}} - \frac{\sqrt{-d^2x^2+1}a}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((c*x^2+b*x+a)/x^2/(-d*x+1)^(1/2)/(d*x+1)^(1/2),x, algorithm="maxima")`

[Out] $-b \log(2\sqrt{-d^2x^2+1}/\text{abs}(x) + 2/\text{abs}(x)) + c \arcsin(d^2x/\sqrt{d^2})/\sqrt{d^2} - \sqrt{-d^2x^2+1}a/x$

Fricas [A] time = 1.14896, size = 201, normalized size = 4.19

$$\frac{bdx \log\left(\frac{\sqrt{dx+1}\sqrt{-dx+1}-1}{x}\right) - \sqrt{dx+1}\sqrt{-dx+1}ad - 2cx \arctan\left(\frac{\sqrt{dx+1}\sqrt{-dx+1}-1}{dx}\right)}{dx}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((c*x^2+b*x+a)/x^2/(-d*x+1)^(1/2)/(d*x+1)^(1/2),x, algorithm="fricas")`

[Out] $(b*d*x*\log((\sqrt{d*x+1}*\sqrt{-d*x+1}-1)/x) - \sqrt{d*x+1}*\sqrt{-d*x+1}*a*d - 2*c*x*\arctan((\sqrt{d*x+1}*\sqrt{-d*x+1}-1)/(d*x)))/(d*x)$

Sympy [C] time = 27.5663, size = 221, normalized size = 4.6

$$\frac{iadG_{6,6}^{5,3}\left(1, \frac{5}{4}, \frac{7}{2}, \frac{1}{4}, 2, \frac{3}{2}, \frac{3}{2}, 2 \middle| \frac{1}{d^2x^2}\right)}{4\pi^{\frac{3}{2}}} + \frac{adG_{6,6}^{2,6}\left(\frac{1}{2}, \frac{3}{4}, 1, \frac{5}{4}, \frac{3}{2}, 1 \middle| \frac{e^{-2i\pi}}{d^2x^2}\right)}{4\pi^{\frac{3}{2}}} + \frac{ibG_{6,6}^{5,3}\left(\frac{3}{2}, \frac{5}{4}, 1, 1, \frac{3}{2} \middle| \frac{1}{d^2x^2}\right)}{4\pi^{\frac{3}{2}}} - \frac{bG_{6,6}^{2,6}}{4\pi^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*x**2+b*x+a)/x**2/(-d*x+1)**(1/2)/(d*x+1)**(1/2),x)
```

```
[Out] I*a*d*meijerg(((5/4, 7/4, 1), (3/2, 3/2, 2)), ((1, 5/4, 3/2, 7/4, 2), (0,))
, 1/(d**2*x**2))/(4*pi**(3/2)) + a*d*meijerg(((1/2, 3/4, 1, 5/4, 3/2, 1), (
)), ((3/4, 5/4), (1/2, 1, 1, 0)), exp_polar(-2*I*pi)/(d**2*x**2))/(4*pi**(3
/2)) + I*b*meijerg(((3/4, 5/4, 1), (1, 1, 3/2)), ((1/2, 3/4, 1, 5/4, 3/2),
(0,)), 1/(d**2*x**2))/(4*pi**(3/2)) - b*meijerg(((0, 1/4, 1/2, 3/4, 1, 1),
()), ((1/4, 3/4), (0, 1/2, 1/2, 0)), exp_polar(-2*I*pi)/(d**2*x**2))/(4*pi*
*(3/2)) - I*c*meijerg(((1/4, 3/4), (1/2, 1/2, 1, 1)), ((0, 1/4, 1/2, 3/4, 1
, 0), ()), 1/(d**2*x**2))/(4*pi**(3/2)*d) + c*meijerg((( -1/2, -1/4, 0, 1/4,
1/2, 1), ()), ((-1/4, 1/4), (-1/2, 0, 0, 0)), exp_polar(-2*I*pi)/(d**2*x**
2))/(4*pi**(3/2)*d)
```

Giac [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: NotImplementedError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*x^2+b*x+a)/x^2/(-d*x+1)^(1/2)/(d*x+1)^(1/2),x, algorithm="giac
")
```

```
[Out] Exception raised: NotImplementedError
```


$$3.153 \quad \int \frac{a+bx+cx^2}{x^3\sqrt{1-dx}\sqrt{1+dx}} dx$$

Optimal. Leaf size=71

$$-\frac{1}{2}(ad^2 + 2c) \tanh^{-1}\left(\sqrt{1-d^2x^2}\right) - \frac{a\sqrt{1-d^2x^2}}{2x^2} - \frac{b\sqrt{1-d^2x^2}}{x}$$

[Out] $-(a*\text{Sqrt}[1 - d^2*x^2])/(2*x^2) - (b*\text{Sqrt}[1 - d^2*x^2])/x - ((2*c + a*d^2)*\text{ArcTanh}[\text{Sqrt}[1 - d^2*x^2]])/2$

Rubi [A] time = 0.188045, antiderivative size = 71, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}} = 0.182$, Rules used = {1609, 1807, 807, 266, 63, 208}

$$-\frac{1}{2}(ad^2 + 2c) \tanh^{-1}\left(\sqrt{1-d^2x^2}\right) - \frac{a\sqrt{1-d^2x^2}}{2x^2} - \frac{b\sqrt{1-d^2x^2}}{x}$$

Antiderivative was successfully verified.

[In] $\text{Int}[(a + b*x + c*x^2)/(x^3*\text{Sqrt}[1 - d*x]*\text{Sqrt}[1 + d*x]), x]$

[Out] $-(a*\text{Sqrt}[1 - d^2*x^2])/(2*x^2) - (b*\text{Sqrt}[1 - d^2*x^2])/x - ((2*c + a*d^2)*\text{ArcTanh}[\text{Sqrt}[1 - d^2*x^2]])/2$

Rule 1609

$\text{Int}[(P_x) * ((a_) + (b_)*(x_))^{(m_)} * ((c_) + (d_)*(x_))^{(n_)} * ((e_) + (f_)*(x_))^{(p_)}, x_Symbol] \rightarrow \text{Int}[P_x * (a*c + b*d*x^2)^m * (e + f*x)^p, x] /;$ FreeQ[{a, b, c, d, e, f, m, n, p}, x] && PolyQ[Px, x] && EqQ[b*c + a*d, 0] && EqQ[m, n] && (IntegerQ[m] || (GtQ[a, 0] && GtQ[c, 0]))

Rule 1807

$\text{Int}[(P_q) * ((c_)*(x_))^{(m_)} * ((a_) + (b_)*(x_)^2)^{(p_)}, x_Symbol] \rightarrow \text{With}[\{Q = \text{PolynomialQuotient}[P_q, c*x, x], R = \text{PolynomialRemainder}[P_q, c*x, x]\}, \text{Simp}[(R*(c*x)^{(m+1)}*(a + b*x^2)^{(p+1)})/(a*c*(m+1)), x] + \text{Dist}[1/(a*c*(m+1)), \text{Int}[(c*x)^{(m+1)}*(a + b*x^2)^p * \text{ExpandToSum}[a*c*(m+1)*Q - b*R*(m+2*p+3)*x, x], x], x] /;$ FreeQ[{a, b, c, p}, x] && PolyQ[Pq, x] && LtQ[m, -1] && (IntegerQ[2*p] || NeQ[Expon[Pq, x], 1])

Rule 807

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] := -Simp[((e*f - d*g)*(d + e*x)^(m + 1)*(a + c*x^2)^(p + 1))
/(2*(p + 1)*(c*d^2 + a*e^2)), x] + Dist[(c*d*f + a*e*g)/(c*d^2 + a*e^2), In
t[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, f, g, m, p}
, x] && NeQ[c*d^2 + a*e^2, 0] && EqQ[Simplify[m + 2*p + 3], 0]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] := Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_)^(m_))*((c_.) + (d_.)*(x_)^(n_)), x_Symbol] := With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] := Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rubi steps

$$\begin{aligned}
\int \frac{a + bx + cx^2}{x^3 \sqrt{1 - dx} \sqrt{1 + dx}} dx &= \int \frac{a + bx + cx^2}{x^3 \sqrt{1 - d^2 x^2}} dx \\
&= -\frac{a\sqrt{1 - d^2 x^2}}{2x^2} - \frac{1}{2} \int \frac{-2b - (2c + ad^2)x}{x^2 \sqrt{1 - d^2 x^2}} dx \\
&= -\frac{a\sqrt{1 - d^2 x^2}}{2x^2} - \frac{b\sqrt{1 - d^2 x^2}}{x} - \frac{1}{2}(-2c - ad^2) \int \frac{1}{x\sqrt{1 - d^2 x^2}} dx \\
&= -\frac{a\sqrt{1 - d^2 x^2}}{2x^2} - \frac{b\sqrt{1 - d^2 x^2}}{x} - \frac{1}{4}(-2c - ad^2) \text{Subst}\left(\int \frac{1}{x\sqrt{1 - d^2 x}} dx, x, x^2\right) \\
&= -\frac{a\sqrt{1 - d^2 x^2}}{2x^2} - \frac{b\sqrt{1 - d^2 x^2}}{x} - \frac{1}{2}\left(a + \frac{2c}{d^2}\right) \text{Subst}\left(\int \frac{1}{\frac{1}{d^2} - \frac{x^2}{d^2}} dx, x, \sqrt{1 - d^2 x^2}\right) \\
&= -\frac{a\sqrt{1 - d^2 x^2}}{2x^2} - \frac{b\sqrt{1 - d^2 x^2}}{x} - \frac{1}{2}(2c + ad^2) \tanh^{-1}\left(\sqrt{1 - d^2 x^2}\right)
\end{aligned}$$

Mathematica [A] time = 0.0474664, size = 56, normalized size = 0.79

$$-\frac{\sqrt{1-d^2x^2}(a+2bx)}{2x^2} - \frac{1}{2}(ad^2+2c)\tanh^{-1}\left(\sqrt{1-d^2x^2}\right)$$

Antiderivative was successfully verified.

[In] Integrate[(a + b*x + c*x^2)/(x^3*Sqrt[1 - d*x]*Sqrt[1 + d*x]),x]

[Out] -((a + 2*b*x)*Sqrt[1 - d^2*x^2])/(2*x^2) - ((2*c + a*d^2)*ArcTanh[Sqrt[1 - d^2*x^2]])/2

Maple [C] time = 0.019, size = 108, normalized size = 1.5

$$-\frac{(\operatorname{csgn}(d))^2}{2x^2}\sqrt{-dx+1}\sqrt{dx+1}\left(\operatorname{Artanh}\left(\frac{1}{\sqrt{-d^2x^2+1}}\right)x^2ad^2+2\operatorname{Artanh}\left(\frac{1}{\sqrt{-d^2x^2+1}}\right)x^2c+2\sqrt{-d^2x^2+1}xb+\sqrt{-d^2x^2+1}a\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((c*x^2+b*x+a)/x^3/(-d*x+1)^(1/2)/(d*x+1)^(1/2),x)

[Out] -1/2*(-d*x+1)^(1/2)*(d*x+1)^(1/2)*csgn(d)^2*(arctanh(1/(-d^2*x^2+1)^(1/2))*x^2*a*d^2+2*arctanh(1/(-d^2*x^2+1)^(1/2))*x^2*c+2*(-d^2*x^2+1)^(1/2)*x*b+(-d^2*x^2+1)^(1/2)*a)/(-d^2*x^2+1)^(1/2)/x^2

Maxima [A] time = 2.73431, size = 132, normalized size = 1.86

$$-\frac{1}{2}ad^2\log\left(\frac{2\sqrt{-d^2x^2+1}}{|x|}+\frac{2}{|x|}\right)-c\log\left(\frac{2\sqrt{-d^2x^2+1}}{|x|}+\frac{2}{|x|}\right)-\frac{\sqrt{-d^2x^2+1}b}{x}-\frac{\sqrt{-d^2x^2+1}a}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((c*x^2+b*x+a)/x^3/(-d*x+1)^(1/2)/(d*x+1)^(1/2),x, algorithm="maxima")

[Out] -1/2*a*d^2*log(2*sqrt(-d^2*x^2 + 1)/abs(x) + 2/abs(x)) - c*log(2*sqrt(-d^2*x^2 + 1)/abs(x) + 2/abs(x)) - sqrt(-d^2*x^2 + 1)*b/x - 1/2*sqrt(-d^2*x^2 + 1)*a/x^2

Fricas [A] time = 1.04925, size = 154, normalized size = 2.17

$$\frac{(ad^2 + 2c)x^2 \log\left(\frac{\sqrt{dx+1}\sqrt{-dx+1}-1}{x}\right) - (2bx + a)\sqrt{dx+1}\sqrt{-dx+1}}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((c*x^2+b*x+a)/x^3/(-d*x+1)^(1/2)/(d*x+1)^(1/2),x, algorithm="fricas")

[Out] 1/2*((a*d^2 + 2*c)*x^2*log((sqrt(d*x + 1)*sqrt(-d*x + 1) - 1)/x) - (2*b*x + a)*sqrt(d*x + 1)*sqrt(-d*x + 1))/x^2

Sympy [C] time = 34.5905, size = 218, normalized size = 3.07

$$\frac{iad^2 G_{6,6}^{5,3} \left(\begin{matrix} \frac{7}{2}, \frac{9}{4}, 1 \\ \frac{3}{2}, \frac{7}{4}, 2, \frac{9}{4}, \frac{5}{2} \end{matrix} \middle| \frac{1}{d^2 x^2} \right) - ad^2 G_{6,6}^{2,6} \left(\begin{matrix} 1, \frac{5}{4}, \frac{3}{2}, \frac{7}{4}, 2, 1 \\ \frac{5}{4}, \frac{7}{4} \end{matrix} \middle| \frac{e^{-2i\pi}}{d^2 x^2} \right)}{4\pi^{\frac{3}{2}}} + \frac{ibd G_{6,6}^{5,3} \left(\begin{matrix} \frac{5}{2}, \frac{7}{4}, 1 \\ 1, \frac{5}{4}, \frac{3}{2}, \frac{7}{4}, 2 \end{matrix} \middle| \frac{1}{d^2 x^2} \right) + bdc}{4\pi^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((c*x**2+b*x+a)/x**3/(-d*x+1)**(1/2)/(d*x+1)**(1/2),x)

[Out] I*a*d**2*meijerg(((7/4, 9/4, 1), (2, 2, 5/2)), ((3/2, 7/4, 2, 9/4, 5/2), (0,)), 1/(d**2*x**2))/(4*pi**(3/2)) - a*d**2*meijerg(((1, 5/4, 3/2, 7/4, 2, 1), ()), ((5/4, 7/4), (1, 3/2, 3/2, 0)), exp_polar(-2*I*pi)/(d**2*x**2))/(4*pi**(3/2)) + I*b*d*meijerg(((5/4, 7/4, 1), (3/2, 3/2, 2)), ((1, 5/4, 3/2, 7/4, 2), (0,)), 1/(d**2*x**2))/(4*pi**(3/2)) + b*d*meijerg(((1/2, 3/4, 1, 5/4, 3/2, 1), ()), ((3/4, 5/4), (1/2, 1, 1, 0)), exp_polar(-2*I*pi)/(d**2*x**2))/(4*pi**(3/2)) + I*c*meijerg(((3/4, 5/4, 1), (1, 1, 3/2)), ((1/2, 3/4, 1, 5/4, 3/2), (0,)), 1/(d**2*x**2))/(4*pi**(3/2)) - c*meijerg(((0, 1/4, 1/2, 3/4, 1, 1), ()), ((1/4, 3/4), (0, 1/2, 1/2, 0)), exp_polar(-2*I*pi)/(d**2*x**2))/(4*pi**(3/2))

Giac [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: NotImplementedError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*x^2+b*x+a)/x^3/(-d*x+1)^(1/2)/(d*x+1)^(1/2),x, algorithm="giac")
```

```
[Out] Exception raised: NotImplementedError
```

$$3.154 \quad \int \frac{x(a+bx+cx^2)}{\sqrt{-1+dx}\sqrt{1+dx}} dx$$

Optimal. Leaf size=87

$$\frac{\sqrt{dx-1}\sqrt{dx+1}(2(3ad^2+2c)+3bd^2x)}{6d^4} + \frac{b \cosh^{-1}(dx)}{2d^3} + \frac{cx^2\sqrt{dx-1}\sqrt{dx+1}}{3d^2}$$

[Out] (c*x^2*Sqrt[-1 + d*x]*Sqrt[1 + d*x])/(3*d^2) + (Sqrt[-1 + d*x]*Sqrt[1 + d*x])*(2*(2*c + 3*a*d^2) + 3*b*d^2*x)/(6*d^4) + (b*ArcCosh[d*x])/(2*d^3)

Rubi [A] time = 0.146262, antiderivative size = 151, normalized size of antiderivative = 1.74, number of steps used = 5, number of rules used = 5, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.167$, Rules used = {1610, 1809, 780, 217, 206}

$$-\frac{(1-d^2x^2)(2(3ad^2+2c)+3bd^2x)}{6d^4\sqrt{dx-1}\sqrt{dx+1}} + \frac{b\sqrt{d^2x^2-1}\tanh^{-1}\left(\frac{dx}{\sqrt{d^2x^2-1}}\right)}{2d^3\sqrt{dx-1}\sqrt{dx+1}} - \frac{cx^2(1-d^2x^2)}{3d^2\sqrt{dx-1}\sqrt{dx+1}}$$

Antiderivative was successfully verified.

[In] Int[(x*(a + b*x + c*x^2))/(Sqrt[-1 + d*x]*Sqrt[1 + d*x]),x]

[Out] -(c*x^2*(1 - d^2*x^2))/(3*d^2*Sqrt[-1 + d*x]*Sqrt[1 + d*x]) - ((2*(2*c + 3*a*d^2) + 3*b*d^2*x)*(1 - d^2*x^2))/(6*d^4*Sqrt[-1 + d*x]*Sqrt[1 + d*x]) + (b*Sqrt[-1 + d^2*x^2]*ArcTanh[(d*x)/Sqrt[-1 + d^2*x^2]])/(2*d^3*Sqrt[-1 + d*x]*Sqrt[1 + d*x])

Rule 1610

Int[(Px_)*((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_)*((e_.) + (f_.)*(x_))^(p_.), x_Symbol] :> Dist[((a + b*x)^FracPart[m]*(c + d*x)^FracPart[m])/(a*c + b*d*x^2)^FracPart[m], Int[Px*(a*c + b*d*x^2)^m*(e + f*x)^p, x], x] /; FreeQ[{a, b, c, d, e, f, m, n, p}, x] && PolyQ[Px, x] && EqQ[b*c + a*d, 0] && EqQ[m, n] && !IntegerQ[m]

Rule 1809

Int[(Pq_)*((c_.)*(x_))^(m_)*((a_.) + (b_.)*(x_)^2)^(p_), x_Symbol] :> With[{q = Expon[Pq, x], f = Coeff[Pq, x, Expon[Pq, x]]}, Simp[(f*(c*x)^(m + q - 1)*(a + b*x^2)^(p + 1))/(b*c^(q - 1)*(m + q + 2*p + 1)), x] + Dist[1/(b*(m + q + 2*p + 1)), Int[(c*x)^m*(a + b*x^2)^p*ExpandToSum[b*(m + q + 2*p + 1)*

Pq - b*f*(m + q + 2*p + 1)*x^q - a*f*(m + q - 1)*x^(q - 2), x], x], x] /; G
 tQ[q, 1] && NeQ[m + q + 2*p + 1, 0]] /; FreeQ[{a, b, c, m, p}, x] && PolyQ[
 Pq, x] && (!IGtQ[m, 0] || IGtQ[p + 1/2, -1])

Rule 780

Int[((d_.) + (e_.)*(x_.))*((f_.) + (g_.)*(x_.))*((a_.) + (c_.)*(x_.)^2)^(p_), x
 _Symbol] := Simp[(((e*f + d*g)*(2*p + 3) + 2*e*g*(p + 1)*x)*(a + c*x^2)^(p
 + 1))/(2*c*(p + 1)*(2*p + 3)), x] - Dist[(a*e*g - c*d*f*(2*p + 3))/(c*(2*p
 + 3)), Int[(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, f, g, p}, x] && !Le
 Q[p, -1]

Rule 217

Int[1/Sqrt[(a_.) + (b_.)*(x_.)^2], x_Symbol] := Subst[Int[1/(1 - b*x^2), x],
 x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] && !GtQ[a, 0]

Rule 206

Int[((a_.) + (b_.)*(x_.)^2)^(-1), x_Symbol] := Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
 Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
 Q[a, 0] || LtQ[b, 0])

Rubi steps

$$\begin{aligned}
 \int \frac{x(a+bx+cx^2)}{\sqrt{-1+dx}\sqrt{1+dx}} dx &= \frac{\sqrt{-1+d^2x^2} \int \frac{x(a+bx+cx^2)}{\sqrt{-1+d^2x^2}} dx}{\sqrt{-1+dx}\sqrt{1+dx}} \\
 &= -\frac{cx^2(1-d^2x^2)}{3d^2\sqrt{-1+dx}\sqrt{1+dx}} + \frac{\sqrt{-1+d^2x^2} \int \frac{x(2c+3ad^2+3bd^2x)}{\sqrt{-1+d^2x^2}} dx}{3d^2\sqrt{-1+dx}\sqrt{1+dx}} \\
 &= -\frac{cx^2(1-d^2x^2)}{3d^2\sqrt{-1+dx}\sqrt{1+dx}} - \frac{(2(2c+3ad^2)+3bd^2x)(1-d^2x^2)}{6d^4\sqrt{-1+dx}\sqrt{1+dx}} + \frac{(b\sqrt{-1+d^2x^2}) \int \frac{1}{\sqrt{-1+d^2x^2}} dx}{2d^2\sqrt{-1+dx}\sqrt{1+dx}} \\
 &= -\frac{cx^2(1-d^2x^2)}{3d^2\sqrt{-1+dx}\sqrt{1+dx}} - \frac{(2(2c+3ad^2)+3bd^2x)(1-d^2x^2)}{6d^4\sqrt{-1+dx}\sqrt{1+dx}} + \frac{(b\sqrt{-1+d^2x^2}) \operatorname{Subst}\left(\int \frac{1}{1-x^2} dx\right)}{2d^2\sqrt{-1+dx}\sqrt{1+dx}} \\
 &= -\frac{cx^2(1-d^2x^2)}{3d^2\sqrt{-1+dx}\sqrt{1+dx}} - \frac{(2(2c+3ad^2)+3bd^2x)(1-d^2x^2)}{6d^4\sqrt{-1+dx}\sqrt{1+dx}} + \frac{b\sqrt{-1+d^2x^2} \tanh^{-1}\left(\frac{dx}{\sqrt{-1+d^2x^2}}\right)}{2d^3\sqrt{-1+dx}\sqrt{1+dx}}
 \end{aligned}$$

Mathematica [A] time = 0.331289, size = 149, normalized size = 1.71

$$\frac{\sqrt{-(dx-1)^2}\sqrt{dx+1}(3d^2(2a+bx)+2c(d^2x^2+2))+6\sqrt{dx-1}\sin^{-1}\left(\frac{\sqrt{1-dx}}{\sqrt{2}}\right)(d(2ad-b)+2c)-12\sqrt{1-dx}\tanh^{-1}\left(\sqrt{\frac{a}{d}}\right)}{6d^4\sqrt{1-dx}}$$

Warning: Unable to verify antiderivative.

[In] Integrate[(x*(a + b*x + c*x^2))/(Sqrt[-1 + d*x]*Sqrt[1 + d*x]),x]

[Out] (Sqrt[-(-1 + d*x)^2]*Sqrt[1 + d*x]*(3*d^2*(2*a + b*x) + 2*c*(2 + d^2*x^2)) + 6*(2*c + d*(-b + 2*a*d))*Sqrt[-1 + d*x]*ArcSin[Sqrt[1 - d*x]/Sqrt[2]] - 12*(c + d*(-b + a*d))*Sqrt[1 - d*x]*ArcTanh[Sqrt[(-1 + d*x)/(1 + d*x)]])/(6*d^4*Sqrt[1 - d*x])

Maple [C] time = 0.023, size = 137, normalized size = 1.6

$$\frac{\text{csgn}(d)}{6d^4}\sqrt{dx-1}\sqrt{dx+1}\left(2\text{csgn}(d)x^2cd^2\sqrt{d^2x^2-1}+3\text{csgn}(d)\sqrt{d^2x^2-1}xbd^2+6\text{csgn}(d)\sqrt{d^2x^2-1}ad^2+4\text{csgn}(d)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(x*(c*x^2+b*x+a)/(d*x-1)^(1/2)/(d*x+1)^(1/2),x)

[Out] 1/6*(d*x-1)^(1/2)*(d*x+1)^(1/2)*(2*csgn(d)*x^2*c*d^2*(d^2*x^2-1)^(1/2)+3*csgn(d)*(d^2*x^2-1)^(1/2)*x*b*d^2+6*csgn(d)*(d^2*x^2-1)^(1/2)*a*d^2+4*csgn(d)*(d^2*x^2-1)^(1/2)*c+3*ln((csgn(d)*(d^2*x^2-1)^(1/2)+d*x)*csgn(d))*b*d)*csgn(d)/d^4/(d^2*x^2-1)^(1/2)

Maxima [A] time = 1.35168, size = 147, normalized size = 1.69

$$\frac{\sqrt{d^2x^2-1}cx^2}{3d^2} + \frac{\sqrt{d^2x^2-1}bx}{2d^2} + \frac{\sqrt{d^2x^2-1}a}{d^2} + \frac{b\log\left(2d^2x+2\sqrt{d^2x^2-1}\sqrt{d^2}\right)}{2\sqrt{d^2}d^2} + \frac{2\sqrt{d^2x^2-1}c}{3d^4}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x*(c*x^2+b*x+a)/(d*x-1)^(1/2)/(d*x+1)^(1/2),x, algorithm="maxima")


```
[Out] 1/3*sqrt(d^2*x^2 - 1)*c*x^2/d^2 + 1/2*sqrt(d^2*x^2 - 1)*b*x/d^2 + sqrt(d^2*x^2 - 1)*a/d^2 + 1/2*b*log(2*d^2*x + 2*sqrt(d^2*x^2 - 1)*sqrt(d^2))/(sqrt(d^2)*d^2) + 2/3*sqrt(d^2*x^2 - 1)*c/d^4
```

Fricas [A] time = 1.05241, size = 176, normalized size = 2.02

$$\frac{3bd \log(-dx + \sqrt{dx+1}\sqrt{dx-1}) - (2cd^2x^2 + 3bd^2x + 6ad^2 + 4c)\sqrt{dx+1}\sqrt{dx-1}}{6d^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(c*x^2+b*x+a)/(d*x-1)^(1/2)/(d*x+1)^(1/2),x, algorithm="fricas")
```

```
[Out] -1/6*(3*b*d*log(-d*x + sqrt(d*x + 1)*sqrt(d*x - 1)) - (2*c*d^2*x^2 + 3*b*d^2*x + 6*a*d^2 + 4*c)*sqrt(d*x + 1)*sqrt(d*x - 1))/d^4
```

Sympy [C] time = 44.7876, size = 308, normalized size = 3.54

$$\frac{{}_aG_{6,6}^{6,2}\left(\begin{matrix} -\frac{1}{4}, \frac{1}{4} \\ -\frac{1}{2}, -\frac{1}{4}, 0, \frac{1}{4}, \frac{1}{2}, 0 \end{matrix} \middle| \frac{1}{d^2x^2} \right)}{4\pi^{\frac{3}{2}}d^2} + \frac{{}_aG_{6,6}^{2,6}\left(\begin{matrix} -1, -\frac{3}{4}, -\frac{1}{2}, -\frac{1}{4}, 0, 1 \\ -\frac{3}{4}, -\frac{1}{4} \end{matrix} \middle| \frac{e^{2i\pi}}{d^2x^2} \right)}{4\pi^{\frac{3}{2}}d^2} + \frac{{}_bG_{6,6}^{6,2}\left(\begin{matrix} -\frac{3}{4}, -\frac{1}{4} \\ -1, -\frac{3}{4}, -\frac{1}{2}, -\frac{1}{4}, 0, 0 \end{matrix} \right)}{4\pi^{\frac{3}{2}}d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(c*x**2+b*x+a)/(d*x-1)**(1/2)/(d*x+1)**(1/2),x)
```

```
[Out] a*meijerg((( -1/4, 1/4), (0, 0, 1/2, 1)), (( -1/2, -1/4, 0, 1/4, 1/2, 0), ()), 1/(d**2*x**2))/(4*pi**(3/2)*d**2) + I*a*meijerg((( -1, -3/4, -1/2, -1/4, 0, 1), ()), (( -3/4, -1/4), (-1, -1/2, -1/2, 0)), exp_polar(2*I*pi)/(d**2*x**2))/(4*pi**(3/2)*d**2) + b*meijerg((( -3/4, -1/4), (-1/2, -1/2, 0, 1)), (( -1, -3/4, -1/2, -1/4, 0, 0), ()), 1/(d**2*x**2))/(4*pi**(3/2)*d**3) - I*b*meijerg((( -3/2, -5/4, -1, -3/4, -1/2, 1), ()), (( -5/4, -3/4), (-3/2, -1, -1, 0)), exp_polar(2*I*pi)/(d**2*x**2))/(4*pi**(3/2)*d**3) + c*meijerg((( -5/4, -3/4), (-1, -1, -1/2, 1)), (( -3/2, -5/4, -1, -3/4, -1/2, 0), ()), 1/(d**2*x**2))/(4*pi**(3/2)*d**4) + I*c*meijerg((( -2, -7/4, -3/2, -5/4, -1, 1), ()), (( -7/4, -5/4), (-2, -3/2, -3/2, 0)), exp_polar(2*I*pi)/(d**2*x**2))/(4*pi**(3/2)*d**4)
```

Giac [A] time = 2.12368, size = 130, normalized size = 1.49

$$\frac{6bd^{10} \log\left(\left|-\sqrt{dx+1} + \sqrt{dx-1}\right|\right) - \left(6ad^{11} - 3bd^{10} + 6cd^9 + \left(2(dx+1)cd^9 + 3bd^{10} - 4cd^9\right)(dx+1)\right)\sqrt{dx+1}\sqrt{dx-1}}{3840d}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x*(c*x^2+b*x+a)/(d*x-1)^(1/2)/(d*x+1)^(1/2),x, algorithm="giac")

[Out] -1/3840*(6*b*d^10*log(abs(-sqrt(d*x + 1) + sqrt(d*x - 1))) - (6*a*d^11 - 3*b*d^10 + 6*c*d^9 + (2*(d*x + 1)*c*d^9 + 3*b*d^10 - 4*c*d^9)*(d*x + 1))*sqrt(d*x + 1)*sqrt(d*x - 1))/d

$$3.155 \quad \int \frac{a+bx+cx^2}{\sqrt{-1+dx}\sqrt{1+dx}} dx$$

Optimal. Leaf size=52

$$\frac{(2ad^2 + c) \cosh^{-1}(dx)}{2d^3} + \frac{\sqrt{dx-1}\sqrt{dx+1}(2b+cx)}{2d^2}$$

[Out] $((2*b + c*x)*\text{Sqrt}[-1 + d*x]*\text{Sqrt}[1 + d*x])/(2*d^2) + ((c + 2*a*d^2)*\text{ArcCosh}[d*x])/(2*d^3)$

Rubi [B] time = 0.0711419, antiderivative size = 135, normalized size of antiderivative = 2.6, number of steps used = 5, number of rules used = 5, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.172$, Rules used = {901, 1815, 641, 217, 206}

$$\frac{\sqrt{d^2x^2-1}(2ad^2+c)\tanh^{-1}\left(\frac{dx}{\sqrt{d^2x^2-1}}\right)}{2d^3\sqrt{dx-1}\sqrt{dx+1}} - \frac{b(1-d^2x^2)}{d^2\sqrt{dx-1}\sqrt{dx+1}} - \frac{cx(1-d^2x^2)}{2d^2\sqrt{dx-1}\sqrt{dx+1}}$$

Antiderivative was successfully verified.

[In] $\text{Int}[(a + b*x + c*x^2)/(\text{Sqrt}[-1 + d*x]*\text{Sqrt}[1 + d*x]), x]$

[Out] $-((b*(1 - d^2*x^2))/(d^2*\text{Sqrt}[-1 + d*x]*\text{Sqrt}[1 + d*x])) - (c*x*(1 - d^2*x^2))/((2*d^2*\text{Sqrt}[-1 + d*x]*\text{Sqrt}[1 + d*x])) + ((c + 2*a*d^2)*\text{Sqrt}[-1 + d^2*x^2])*\text{ArcTanh}[(d*x)/\text{Sqrt}[-1 + d^2*x^2]]/(2*d^3*\text{Sqrt}[-1 + d*x]*\text{Sqrt}[1 + d*x])$

Rule 901

$\text{Int}[(d + e*x)^m * ((f + g*x)^n * ((a + b*x + c*x^2)^p), x_Symbol] := \text{Dist}[(d + e*x)^{\text{FracPart}[m]} * (f + g*x)^{\text{FracPart}[m]}] / (d*f + e*g*x^2)^{\text{FracPart}[m]}, \text{Int}[(d*f + e*g*x^2)^m * (a + b*x + c*x^2)^p, x], x] /;$ $\text{FreeQ}\{a, b, c, d, e, f, g, m, n, p\}, x] \&\& \text{EqQ}[m - n, 0] \&\& \text{EqQ}[e*f + d*g, 0]$

Rule 1815

$\text{Int}[(Pq)*(a + b*x^2)^p, x_Symbol] := \text{With}\{q = \text{Expon}[Pq, x], e = \text{Coeff}[Pq, x, \text{Expon}[Pq, x]]\}, \text{Simp}[(e*x^{(q-1)}*(a + b*x^2)^{(p+1)})/(b*(q + 2*p + 1)), x] + \text{Dist}[1/(b*(q + 2*p + 1)), \text{Int}[(a + b*x^2)^p * \text{ExpandToSum}[b*(q + 2*p + 1)*Pq - a*e*(q-1)*x^{(q-2)} - b*e*(q + 2*p + 1)*x^q, x], x] /;$ $\text{FreeQ}\{a, b, p\}, x] \&\& \text{PolyQ}[Pq, x] \&\& !\text{LeQ}[p, -1]$

Rule 641

```
Int[((d_) + (e_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] := Simp[(e*(
a + c*x^2)^(p + 1))/(2*c*(p + 1)), x] + Dist[d, Int[(a + c*x^2)^p, x], x] /
; FreeQ[{a, c, d, e, p}, x] && NeQ[p, -1]
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] := Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] && !GtQ[a, 0]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] := Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rubi steps

$$\begin{aligned} \int \frac{a + bx + cx^2}{\sqrt{-1 + dx}\sqrt{1 + dx}} dx &= \frac{\sqrt{-1 + d^2x^2} \int \frac{a+bx+cx^2}{\sqrt{-1+d^2x^2}} dx}{\sqrt{-1 + dx}\sqrt{1 + dx}} \\ &= -\frac{cx(1 - d^2x^2)}{2d^2\sqrt{-1 + dx}\sqrt{1 + dx}} + \frac{\sqrt{-1 + d^2x^2} \int \frac{c+2ad^2+2bd^2x}{\sqrt{-1+d^2x^2}} dx}{2d^2\sqrt{-1 + dx}\sqrt{1 + dx}} \\ &= -\frac{b(1 - d^2x^2)}{d^2\sqrt{-1 + dx}\sqrt{1 + dx}} - \frac{cx(1 - d^2x^2)}{2d^2\sqrt{-1 + dx}\sqrt{1 + dx}} + \frac{\left((c + 2ad^2)\sqrt{-1 + d^2x^2}\right) \int \frac{1}{\sqrt{-1+d^2x^2}} dx}{2d^2\sqrt{-1 + dx}\sqrt{1 + dx}} \\ &= -\frac{b(1 - d^2x^2)}{d^2\sqrt{-1 + dx}\sqrt{1 + dx}} - \frac{cx(1 - d^2x^2)}{2d^2\sqrt{-1 + dx}\sqrt{1 + dx}} + \frac{\left((c + 2ad^2)\sqrt{-1 + d^2x^2}\right) \text{Subst}\left(\int \frac{1}{1-d^2x^2} dx\right)}{2d^2\sqrt{-1 + dx}\sqrt{1 + dx}} \\ &= -\frac{b(1 - d^2x^2)}{d^2\sqrt{-1 + dx}\sqrt{1 + dx}} - \frac{cx(1 - d^2x^2)}{2d^2\sqrt{-1 + dx}\sqrt{1 + dx}} + \frac{(c + 2ad^2)\sqrt{-1 + d^2x^2} \tanh^{-1}\left(\frac{dx}{\sqrt{-1+d^2x^2}}\right)}{2d^3\sqrt{-1 + dx}\sqrt{1 + dx}} \end{aligned}$$

Mathematica [B] time = 0.210479, size = 126, normalized size = 2.42

$$\frac{4\sqrt{1 - dx} \tanh^{-1}\left(\sqrt{\frac{dx-1}{dx+1}}\right) (d(ad - b) + c) + d\sqrt{-(dx - 1)^2}\sqrt{dx + 1}(2b + cx) + 2\sqrt{dx - 1}(2bd - c) \sin^{-1}\left(\frac{\sqrt{1-dx}}{\sqrt{2}}\right)}{2d^3\sqrt{1 - dx}}$$

Warning: Unable to verify antiderivative.

[In] Integrate[(a + b*x + c*x^2)/(Sqrt[-1 + d*x]*Sqrt[1 + d*x]),x]

[Out] (d*(2*b + c*x)*Sqrt[-(-1 + d*x)^2]*Sqrt[1 + d*x] + 2*(-c + 2*b*d)*Sqrt[-1 + d*x]*ArcSin[Sqrt[1 - d*x]/Sqrt[2]] + 4*(c + d*(-b + a*d))*Sqrt[1 - d*x]*ArcTanh[Sqrt[(-1 + d*x)/(1 + d*x)])]/(2*d^3*Sqrt[1 - d*x])

Maple [C] time = 0.016, size = 120, normalized size = 2.3

$$\frac{\operatorname{csgn}(d)}{2d^3} \sqrt{dx-1} \sqrt{dx+1} \left(\operatorname{csgn}(d) d \sqrt{d^2x^2-1} cx + 2 \operatorname{csgn}(d) d \sqrt{d^2x^2-1} b + 2 \ln \left(\left(\operatorname{csgn}(d) \sqrt{d^2x^2-1} + dx \right) \operatorname{csgn}(d) \right) \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((c*x^2+b*x+a)/(d*x-1)^(1/2)/(d*x+1)^(1/2),x)

[Out] 1/2*(d*x-1)^(1/2)*(d*x+1)^(1/2)*(csgn(d)*d*(d^2*x^2-1)^(1/2)*x*c+2*csgn(d)*d*(d^2*x^2-1)^(1/2)*b+2*ln((csgn(d)*(d^2*x^2-1)^(1/2)+d*x)*csgn(d))*a*d^2+ln((csgn(d)*(d^2*x^2-1)^(1/2)+d*x)*csgn(d))*c)*csgn(d)/d^3/(d^2*x^2-1)^(1/2)

Maxima [B] time = 1.35955, size = 142, normalized size = 2.73

$$\frac{a \log \left(2d^2x + 2\sqrt{d^2x^2-1}\sqrt{d^2} \right)}{\sqrt{d^2}} + \frac{\sqrt{d^2x^2-1}cx}{2d^2} + \frac{\sqrt{d^2x^2-1}b}{d^2} + \frac{c \log \left(2d^2x + 2\sqrt{d^2x^2-1}\sqrt{d^2} \right)}{2\sqrt{d^2}d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((c*x^2+b*x+a)/(d*x-1)^(1/2)/(d*x+1)^(1/2),x, algorithm="maxima")

[Out] a*log(2*d^2*x + 2*sqrt(d^2*x^2 - 1)*sqrt(d^2))/sqrt(d^2) + 1/2*sqrt(d^2*x^2 - 1)*c*x/d^2 + sqrt(d^2*x^2 - 1)*b/d^2 + 1/2*c*log(2*d^2*x + 2*sqrt(d^2*x^2 - 1)*sqrt(d^2))/(sqrt(d^2)*d^2)

Fricas [A] time = 1.10158, size = 150, normalized size = 2.88

$$\frac{(cdx + 2bd)\sqrt{dx+1}\sqrt{dx-1} - (2ad^2 + c) \log(-dx + \sqrt{dx+1}\sqrt{dx-1})}{2d^3}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((c*x^2+b*x+a)/(d*x-1)^(1/2)/(d*x+1)^(1/2),x, algorithm="fricas")

[Out] 1/2*((c*d*x + 2*b*d)*sqrt(d*x + 1)*sqrt(d*x - 1) - (2*a*d^2 + c)*log(-d*x + sqrt(d*x + 1)*sqrt(d*x - 1)))/d^3

Sympy [C] time = 20.7389, size = 277, normalized size = 5.33

$$\frac{aG_{6,6}^{6,2}\left(0, \frac{1}{4}, \frac{1}{2}, \frac{3}{4}, 1, 0, \frac{1}{2}, \frac{1}{2}, 1, 1 \left| \frac{1}{d^2 x^2} \right. \right)}{4\pi^{\frac{3}{2}} d} - \frac{iaG_{6,6}^{2,6}\left(-\frac{1}{2}, -\frac{1}{4}, 0, \frac{1}{4}, \frac{1}{2}, 1, -\frac{1}{4}, \frac{1}{4}, -\frac{1}{2}, 0, 0, 0 \left| \frac{e^{2i\pi}}{d^2 x^2} \right. \right)}{4\pi^{\frac{3}{2}} d} + \frac{bG_{6,6}^{6,2}\left(-\frac{1}{2}, -\frac{1}{4}, 0, \frac{1}{4}, \frac{1}{2}, 0, 0, 0, \frac{1}{2}, 1 \left| \frac{1}{d^2} \right. \right)}{4\pi^{\frac{3}{2}} d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((c*x**2+b*x+a)/(d*x-1)**(1/2)/(d*x+1)**(1/2),x)

[Out] a*meijerg(((1/4, 3/4), (1/2, 1/2, 1, 1)), ((0, 1/4, 1/2, 3/4, 1, 0), ()), 1/(d**2*x**2))/(4*pi**(3/2)*d) - I*a*meijerg(((1/2, 1/2, 1, 1), (-1/2, -1/4, 0, 1/4, 1/2, 1), ()), ((-1/4, 1/4), (-1/2, 0, 0, 0)), exp_polar(2*I*pi)/(d**2*x**2))/(4*pi**(3/2)*d) + b*meijerg(((1/4, 1/4), (0, 0, 1/2, 1)), ((-1/2, -1/4, 0, 1/4, 1/2, 0), ()), 1/(d**2*x**2))/(4*pi**(3/2)*d**2) + I*b*meijerg(((1, -3/4, -1/2, -1/4, 0, 1), (-1, -3/4, -1/2, -1/4, 0, 1), ()), ((-3/4, -1/4), (-1, -1/2, -1/2, 0)), exp_polar(2*I*pi)/(d**2*x**2))/(4*pi**(3/2)*d**2) + c*meijerg(((1/4, 1/4), (-1/2, -1/2, 0, 1), (-1, -3/4, -1/2, -1/4, 0, 0), ()), 1/(d**2*x**2))/(4*pi**(3/2)*d**3) - I*c*meijerg(((1/2, 1/2, 1, 1), (-3/2, -5/4, -1, -3/4, -1/2, 1), ()), ((-5/4, -3/4), (-3/2, -1, -1, 0)), exp_polar(2*I*pi)/(d**2*x**2))/(4*pi**(3/2)*d**3)

Giac [A] time = 2.5708, size = 104, normalized size = 2.

$$\frac{((dx + 1)cd^4 + 2bd^5 - cd^4)\sqrt{dx + 1}\sqrt{dx - 1} - 2(2ad^6 + cd^4)\log(|-\sqrt{dx + 1} + \sqrt{dx - 1}|)}{192d}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((c*x^2+b*x+a)/(d*x-1)^(1/2)/(d*x+1)^(1/2),x, algorithm="giac")

[Out] 1/192*((d*x + 1)*c*d^4 + 2*b*d^5 - c*d^4)*sqrt(d*x + 1)*sqrt(d*x - 1) - 2*(2*a*d^6 + c*d^4)*log(abs(-sqrt(d*x + 1) + sqrt(d*x - 1)))/d

$$3.156 \quad \int \frac{a+bx+cx^2}{x\sqrt{-1+dx}\sqrt{1+dx}} dx$$

Optimal. Leaf size=55

$$a \tan^{-1}\left(\sqrt{dx-1}\sqrt{dx+1}\right) + \frac{b \cosh^{-1}(dx)}{d} + \frac{c\sqrt{dx-1}\sqrt{dx+1}}{d^2}$$

[Out] (c*Sqrt[-1 + d*x]*Sqrt[1 + d*x])/d^2 + (b*ArcCosh[d*x])/d + a*ArcTan[Sqrt[-1 + d*x]*Sqrt[1 + d*x]]

Rubi [B] time = 0.184061, antiderivative size = 135, normalized size of antiderivative = 2.45, number of steps used = 8, number of rules used = 8, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}} = 0.25$, Rules used = {1610, 1809, 844, 217, 206, 266, 63, 205}

$$\frac{a\sqrt{d^2x^2-1} \tan^{-1}\left(\sqrt{d^2x^2-1}\right)}{\sqrt{dx-1}\sqrt{dx+1}} + \frac{b\sqrt{d^2x^2-1} \tanh^{-1}\left(\frac{dx}{\sqrt{d^2x^2-1}}\right)}{d\sqrt{dx-1}\sqrt{dx+1}} - \frac{c(1-d^2x^2)}{d^2\sqrt{dx-1}\sqrt{dx+1}}$$

Antiderivative was successfully verified.

[In] Int[(a + b*x + c*x^2)/(x*Sqrt[-1 + d*x]*Sqrt[1 + d*x]),x]

[Out] -((c*(1 - d^2*x^2))/(d^2*Sqrt[-1 + d*x]*Sqrt[1 + d*x])) + (a*Sqrt[-1 + d^2*x^2]*ArcTan[Sqrt[-1 + d^2*x^2]])/(Sqrt[-1 + d*x]*Sqrt[1 + d*x]) + (b*Sqrt[-1 + d^2*x^2]*ArcTanh[(d*x)/Sqrt[-1 + d^2*x^2]])/(d*Sqrt[-1 + d*x]*Sqrt[1 + d*x])

Rule 1610

Int[(Px_)*((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_)*((e_.) + (f_.)*(x_))^(p_), x_Symbol] :> Dist[((a + b*x)^FracPart[m]*(c + d*x)^FracPart[m])/(a*c + b*d*x^2)^FracPart[m], Int[Px*(a*c + b*d*x^2)^m*(e + f*x)^p, x], x] /; FreeQ[{a, b, c, d, e, f, m, n, p}, x] && PolyQ[Px, x] && EqQ[b*c + a*d, 0] && EqQ[m, n] && !IntegerQ[m]

Rule 1809

Int[(Pq_)*((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> With[{q = Expon[Pq, x], f = Coeff[Pq, x, Expon[Pq, x]]}, Simp[(f*(c*x)^(m + q - 1)*(a + b*x^2)^(p + 1))/(b*c^(q - 1)*(m + q + 2*p + 1)), x] + Dist[1/(b*(m + q + 2*p + 1)), Int[(c*x)^m*(a + b*x^2)^p*ExpandToSum[b*(m + q + 2*p + 1)*

$Pq - b*f*(m + q + 2*p + 1)*x^q - a*f*(m + q - 1)*x^{(q - 2)}, x], x] /;$ $GtQ[q, 1] \&\& NeQ[m + q + 2*p + 1, 0] /;$ $FreeQ[\{a, b, c, m, p\}, x] \&\& PolyQ[Pq, x] \&\& (!IGtQ[m, 0] || IGtQ[p + 1/2, -1])$

Rule 844

$Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] := Dist[g/e, Int[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] + Dist[(e*f - d*g)/e, Int[(d + e*x)^m*(a + c*x^2)^p, x], x] /;$ $FreeQ[\{a, c, d, e, f, g, m, p\}, x] \&\& NeQ[c*d^2 + a*e^2, 0] \&\& !IGtQ[m, 0]$

Rule 217

$Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] := Subst[Int[1/(1 - b*x^2), x], x, x/Sqrt[a + b*x^2]] /;$ $FreeQ[\{a, b\}, x] \&\& !GtQ[a, 0]$

Rule 206

$Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] := Simp[(1*ArcTanh[(Rt[-b, 2]*x)/Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /;$ $FreeQ[\{a, b\}, x] \&\& NegQ[a/b] \&\& (GtQ[a, 0] || LtQ[b, 0])$

Rule 266

$Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] := Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /;$ $FreeQ[\{a, b, m, n, p\}, x] \&\& IntegerQ[Simplify[(m + 1)/n]]$

Rule 63

$Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] := With[\{p = Denominator[m]\}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b + (d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x] /;$ $FreeQ[\{a, b, c, d\}, x] \&\& NeQ[b*c - a*d, 0] \&\& LtQ[-1, m, 0] \&\& LeQ[-1, n, 0] \&\& LeQ[Denominator[n], Denominator[m]] \&\& IntLinearQ[a, b, c, d, m, n, x]$

Rule 205

$Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] := Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a/b, 2]])/a, x] /;$ $FreeQ[\{a, b\}, x] \&\& PosQ[a/b]$

Rubi steps

$$\begin{aligned}
\int \frac{a + bx + cx^2}{x\sqrt{-1 + dx}\sqrt{1 + dx}} dx &= \frac{\sqrt{-1 + d^2x^2} \int \frac{a+bx+cx^2}{x\sqrt{-1+d^2x^2}} dx}{\sqrt{-1 + dx}\sqrt{1 + dx}} \\
&= -\frac{c(1 - d^2x^2)}{d^2\sqrt{-1 + dx}\sqrt{1 + dx}} + \frac{\sqrt{-1 + d^2x^2} \int \frac{ad^2+bd^2x}{x\sqrt{-1+d^2x^2}} dx}{d^2\sqrt{-1 + dx}\sqrt{1 + dx}} \\
&= -\frac{c(1 - d^2x^2)}{d^2\sqrt{-1 + dx}\sqrt{1 + dx}} + \frac{(a\sqrt{-1 + d^2x^2}) \int \frac{1}{x\sqrt{-1+d^2x^2}} dx}{\sqrt{-1 + dx}\sqrt{1 + dx}} + \frac{(b\sqrt{-1 + d^2x^2}) \int \frac{1}{\sqrt{-1+d^2x^2}} dx}{\sqrt{-1 + dx}\sqrt{1 + dx}} \\
&= -\frac{c(1 - d^2x^2)}{d^2\sqrt{-1 + dx}\sqrt{1 + dx}} + \frac{(a\sqrt{-1 + d^2x^2}) \text{Subst}\left(\int \frac{1}{x\sqrt{-1+d^2x}} dx, x, x^2\right)}{2\sqrt{-1 + dx}\sqrt{1 + dx}} + \frac{(b\sqrt{-1 + d^2x^2}) \text{Subst}\left(\int \frac{1}{\sqrt{-1+d^2x}} dx, x, x^2\right)}{\sqrt{-1 + dx}\sqrt{1 + dx}} \\
&= -\frac{c(1 - d^2x^2)}{d^2\sqrt{-1 + dx}\sqrt{1 + dx}} + \frac{b\sqrt{-1 + d^2x^2} \tanh^{-1}\left(\frac{dx}{\sqrt{-1+d^2x^2}}\right)}{d\sqrt{-1 + dx}\sqrt{1 + dx}} + \frac{(a\sqrt{-1 + d^2x^2}) \text{Subst}\left(\int \frac{1}{\frac{1}{d^2} + \frac{x}{a}} dx, x, x^2\right)}{d^2\sqrt{-1 + dx}\sqrt{1 + dx}} \\
&= -\frac{c(1 - d^2x^2)}{d^2\sqrt{-1 + dx}\sqrt{1 + dx}} + \frac{a\sqrt{-1 + d^2x^2} \tan^{-1}\left(\sqrt{-1 + d^2x^2}\right)}{\sqrt{-1 + dx}\sqrt{1 + dx}} + \frac{b\sqrt{-1 + d^2x^2} \tanh^{-1}\left(\frac{dx}{\sqrt{-1+d^2x^2}}\right)}{d\sqrt{-1 + dx}\sqrt{1 + dx}}
\end{aligned}$$

Mathematica [B] time = 0.399322, size = 128, normalized size = 2.33

$$\frac{ad^2\sqrt{d^2x^2-1} \tan^{-1}\left(\sqrt{d^2x^2-1}\right) + cd^2x^2 - 2c\sqrt{1-d^2x^2} \sin^{-1}\left(\frac{\sqrt{1-dx}}{\sqrt{2}}\right) - c}{\sqrt{dx-1}\sqrt{dx+1}} - 2(c - bd) \tanh^{-1}\left(\sqrt{\frac{dx-1}{dx+1}}\right)$$

Warning: Unable to verify antiderivative.

[In] Integrate[(a + b*x + c*x^2)/(x*Sqrt[-1 + d*x]*Sqrt[1 + d*x]), x]

[Out] ((-c + c*d^2*x^2 - 2*c*Sqrt[1 - d^2*x^2]*ArcSin[Sqrt[1 - d*x]/Sqrt[2]] + a*d^2*Sqrt[-1 + d^2*x^2]*ArcTan[Sqrt[-1 + d^2*x^2]])/(Sqrt[-1 + d*x]*Sqrt[1 + d*x]) - 2*(c - b*d)*ArcTanh[Sqrt[(-1 + d*x)/(1 + d*x)]])/d^2

Maple [C] time = 0.019, size = 95, normalized size = 1.7

$$\frac{\text{csgn}(d)}{d^2} \left(-\text{csgn}(d) \arctan\left(\frac{1}{\sqrt{d^2x^2-1}}\right) ad^2 + \text{csgn}(d) \sqrt{d^2x^2-1}c + \ln\left(\left(\text{csgn}(d) \sqrt{(dx+1)(dx-1)} + dx\right) \text{csgn}(d)\right) b \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `int((c*x^2+b*x+a)/x/(d*x-1)^(1/2)/(d*x+1)^(1/2),x)`

[Out] `(-csgn(d)*arctan(1/(d^2*x^2-1)^(1/2))*a*d^2+csgn(d)*(d^2*x^2-1)^(1/2)*c+ln((csgn(d)*((d*x+1)*(d*x-1))^(1/2)+d*x)*csgn(d))*b*d*(d*x-1)^(1/2)*(d*x+1)^(1/2)/d^2*csgn(d)/(d^2*x^2-1)^(1/2))`

Maxima [A] time = 3.91204, size = 86, normalized size = 1.56

$$-a \arcsin\left(\frac{1}{\sqrt{d^2|x|}}\right) + \frac{b \log\left(2d^2x + 2\sqrt{d^2x^2 - 1}\sqrt{d^2}\right)}{\sqrt{d^2}} + \frac{\sqrt{d^2x^2 - 1}c}{d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((c*x^2+b*x+a)/x/(d*x-1)^(1/2)/(d*x+1)^(1/2),x, algorithm="maxima")`

[Out] `-a*arcsin(1/(sqrt(d^2)*abs(x))) + b*log(2*d^2*x + 2*sqrt(d^2*x^2 - 1)*sqrt(d^2))/sqrt(d^2) + sqrt(d^2*x^2 - 1)*c/d^2`

Fricas [A] time = 1.08568, size = 184, normalized size = 3.35

$$\frac{2ad^2 \arctan(-dx + \sqrt{dx+1}\sqrt{dx-1}) - bd \log(-dx + \sqrt{dx+1}\sqrt{dx-1}) + \sqrt{dx+1}\sqrt{dx-1}c}{d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((c*x^2+b*x+a)/x/(d*x-1)^(1/2)/(d*x+1)^(1/2),x, algorithm="fricas")`

[Out] `(2*a*d^2*arctan(-d*x + sqrt(d*x + 1)*sqrt(d*x - 1)) - b*d*log(-d*x + sqrt(d*x + 1)*sqrt(d*x - 1)) + sqrt(d*x + 1)*sqrt(d*x - 1)*c)/d^2`

Sympy [C] time = 26.2475, size = 240, normalized size = 4.36

$$-\frac{aG_{6,6}^{5,3}\left(\frac{3}{4}, \frac{5}{4}, 1, 1, 1, \frac{3}{2}\right) \left(\frac{1}{d^2x^2}\right)}{4\pi^{\frac{3}{2}}} + \frac{iaG_{6,6}^{2,6}\left(0, \frac{1}{4}, \frac{1}{2}, \frac{3}{4}, 1, 1, \frac{1}{4}, \frac{1}{4}\right) \left(\frac{e^{2i\pi}}{d^2x^2}\right)}{4\pi^{\frac{3}{2}}} + \frac{bG_{6,6}^{6,2}\left(0, \frac{1}{4}, \frac{1}{2}, \frac{3}{4}, 1, 0, \frac{1}{2}, \frac{1}{2}, 1, 1\right) \left(\frac{1}{d^2x^2}\right)}{4\pi^{\frac{3}{2}}d} - \frac{ibG_{6,6}^{2,6}\left(\frac{1}{2}, \frac{1}{2}, 1, 1, 1, 1, \frac{1}{2}, \frac{1}{2}\right) \left(\frac{1}{d^2x^2}\right)}{4\pi^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((c*x**2+b*x+a)/x/(d*x-1)**(1/2)/(d*x+1)**(1/2),x)

[Out] $-a \operatorname{meijerg}\left(\left(\frac{3}{4}, \frac{5}{4}, 1\right), (1, 1, \frac{3}{2})\right), \left(\left(\frac{1}{2}, \frac{3}{4}, 1, \frac{5}{4}, \frac{3}{2}\right), (0,)\right), 1 / (d^{**2}x^{**2}) / (4\pi^{**(\frac{3}{2})}) + I a \operatorname{meijerg}\left(\left(0, \frac{1}{4}, \frac{1}{2}, \frac{3}{4}, 1, 1\right), ()\right), \left(\frac{1}{4}, \frac{3}{4}\right), (0, \frac{1}{2}, \frac{1}{2}, 0)\right), \exp_{\text{polar}}(2I\pi) / (d^{**2}x^{**2}) / (4\pi^{**(\frac{3}{2})}) + b \operatorname{meijerg}\left(\left(\frac{1}{4}, \frac{3}{4}\right), (\frac{1}{2}, \frac{1}{2}, 1, 1)\right), \left(0, \frac{1}{4}, \frac{1}{2}, \frac{3}{4}, 1, 0\right), ()\right), 1 / (d^{**2}x^{**2}) / (4\pi^{**(\frac{3}{2})}d) - I b \operatorname{meijerg}\left(\left(-\frac{1}{2}, -\frac{1}{4}, 0, \frac{1}{4}, \frac{1}{2}, 1\right), ()\right), \left(-\frac{1}{4}, \frac{1}{4}\right), (-\frac{1}{2}, 0, 0, 0)\right), \exp_{\text{polar}}(2I\pi) / (d^{**2}x^{**2}) / (4\pi^{**(\frac{3}{2})}d) + c \operatorname{meijerg}\left(\left(-\frac{1}{4}, \frac{1}{4}\right), (0, 0, \frac{1}{2}, 1)\right), \left(-\frac{1}{2}, -\frac{1}{4}, 0, \frac{1}{4}, \frac{1}{2}, 0\right), ()\right), 1 / (d^{**2}x^{**2}) / (4\pi^{**(\frac{3}{2})}d^{**2}) + I c \operatorname{meijerg}\left(\left(-1, -\frac{3}{4}, -\frac{1}{2}, -\frac{1}{4}, 0, 1\right), ()\right), \left(-\frac{3}{4}, -\frac{1}{4}\right), (-1, -\frac{1}{2}, -\frac{1}{2}, 0)\right), \exp_{\text{polar}}(2I\pi) / (d^{**2}x^{**2}) / (4\pi^{**(\frac{3}{2})}d^{**2})$

Giac [A] time = 1.98647, size = 96, normalized size = 1.75

$$-2a \arctan\left(\frac{1}{2}\left(\sqrt{dx+1} - \sqrt{dx-1}\right)^2\right) - \frac{b \log\left(\left(\sqrt{dx+1} - \sqrt{dx-1}\right)^2\right)}{d} + \frac{\sqrt{dx+1}\sqrt{dx-1}c}{d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((c*x^2+b*x+a)/x/(d*x-1)^(1/2)/(d*x+1)^(1/2),x, algorithm="giac")

[Out] $-2a \arctan(1/2 * (\sqrt{dx+1} - \sqrt{dx-1})^2) - b \log((\sqrt{dx+1} - \sqrt{dx-1})^2) / d + \sqrt{dx+1} \sqrt{dx-1} c / d^2$

$$3.157 \quad \int \frac{a+bx+cx^2}{x^2\sqrt{-1+dx}\sqrt{1+dx}} dx$$

Optimal. Leaf size=55

$$\frac{a\sqrt{dx-1}\sqrt{dx+1}}{x} + b \tan^{-1}\left(\sqrt{dx-1}\sqrt{dx+1}\right) + \frac{c \cosh^{-1}(dx)}{d}$$

[Out] (a*Sqrt[-1 + d*x]*Sqrt[1 + d*x])/x + (c*ArcCosh[d*x])/d + b*ArcTan[Sqrt[-1 + d*x]*Sqrt[1 + d*x]]

Rubi [B] time = 0.182098, antiderivative size = 135, normalized size of antiderivative = 2.45, number of steps used = 8, number of rules used = 8, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}} = 0.25$, Rules used = {1610, 1807, 844, 217, 206, 266, 63, 205}

$$-\frac{a(1-d^2x^2)}{x\sqrt{dx-1}\sqrt{dx+1}} + \frac{b\sqrt{d^2x^2-1}\tan^{-1}\left(\sqrt{d^2x^2-1}\right)}{\sqrt{dx-1}\sqrt{dx+1}} + \frac{c\sqrt{d^2x^2-1}\tanh^{-1}\left(\frac{dx}{\sqrt{d^2x^2-1}}\right)}{d\sqrt{dx-1}\sqrt{dx+1}}$$

Antiderivative was successfully verified.

[In] Int[(a + b*x + c*x^2)/(x^2*Sqrt[-1 + d*x]*Sqrt[1 + d*x]), x]

[Out] -((a*(1 - d^2*x^2))/(x*Sqrt[-1 + d*x]*Sqrt[1 + d*x])) + (b*Sqrt[-1 + d^2*x^2]*ArcTan[Sqrt[-1 + d^2*x^2]])/(Sqrt[-1 + d*x]*Sqrt[1 + d*x]) + (c*Sqrt[-1 + d^2*x^2]*ArcTanh[(d*x)/Sqrt[-1 + d^2*x^2]])/(d*Sqrt[-1 + d*x]*Sqrt[1 + d*x])

Rule 1610

Int[(Px_)*((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_)*((e_.) + (f_.)*(x_))^(p_), x_Symbol] :> Dist[((a + b*x)^FracPart[m]*(c + d*x)^FracPart[m])/(a*c + b*d*x^2)^FracPart[m], Int[Px*(a*c + b*d*x^2)^m*(e + f*x)^p, x], x] /; FreeQ[{a, b, c, d, e, f, m, n, p}, x] && PolyQ[Px, x] && EqQ[b*c + a*d, 0] && EqQ[m, n] && !IntegerQ[m]

Rule 1807

Int[(Pq_)*((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> With[{Q = PolynomialQuotient[Pq, c*x, x], R = PolynomialRemainder[Pq, c*x, x]}, Simp[(R*(c*x)^(m + 1)*(a + b*x^2)^(p + 1))/(a*c*(m + 1)), x] + Dist[1/(a*c*(m + 1)), Int[(c*x)^(m + 1)*(a + b*x^2)^p*ExpandToSum[a*c*(m + 1)*Q - b*R*(m

+ 2*p + 3)*x, x], x]] /; FreeQ[{a, b, c, p}, x] && PolyQ[Pq, x] && LtQ[m, -1] && (IntegerQ[2*p] || NeQ[Expon[Pq, x], 1])

Rule 844

Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] := Dist[g/e, Int[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] + Dist[(e*f - d*g)/e, Int[(d + e*x)^m*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, f, g, m, p}, x] && NeQ[c*d^2 + a*e^2, 0] && !IGtQ[m, 0]

Rule 217

Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] := Subst[Int[1/(1 - b*x^2), x], x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] && !GtQ[a, 0]

Rule 206

Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] := Simp[(1*ArcTanh[(Rt[-b, 2]*x)/Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (GtQ[a, 0] || LtQ[b, 0])

Rule 266

Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] := Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]

Rule 63

Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_)^(n_)), x_Symbol] := With[{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b + (d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Denominator[m]] && IntLinearQ[a, b, c, d, m, n, x]

Rule 205

Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] := Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]

Rubi steps

$$\begin{aligned}
\int \frac{a + bx + cx^2}{x^2 \sqrt{-1 + dx} \sqrt{1 + dx}} dx &= \frac{\sqrt{-1 + d^2 x^2} \int \frac{a + bx + cx^2}{x^2 \sqrt{-1 + d^2 x^2}} dx}{\sqrt{-1 + dx} \sqrt{1 + dx}} \\
&= -\frac{a(1 - d^2 x^2)}{x \sqrt{-1 + dx} \sqrt{1 + dx}} + \frac{\sqrt{-1 + d^2 x^2} \int \frac{b + cx}{x \sqrt{-1 + d^2 x^2}} dx}{\sqrt{-1 + dx} \sqrt{1 + dx}} \\
&= -\frac{a(1 - d^2 x^2)}{x \sqrt{-1 + dx} \sqrt{1 + dx}} + \frac{(b \sqrt{-1 + d^2 x^2}) \int \frac{1}{x \sqrt{-1 + d^2 x^2}} dx}{\sqrt{-1 + dx} \sqrt{1 + dx}} + \frac{(c \sqrt{-1 + d^2 x^2}) \int \frac{1}{\sqrt{-1 + d^2 x^2}} dx}{\sqrt{-1 + dx} \sqrt{1 + dx}} \\
&= -\frac{a(1 - d^2 x^2)}{x \sqrt{-1 + dx} \sqrt{1 + dx}} + \frac{(b \sqrt{-1 + d^2 x^2}) \text{Subst} \left(\int \frac{1}{x \sqrt{-1 + d^2 x}} dx, x, x^2 \right)}{2 \sqrt{-1 + dx} \sqrt{1 + dx}} + \frac{(c \sqrt{-1 + d^2 x^2}) \text{Subst} \left(\int \frac{1}{\sqrt{-1 + d^2 x}} dx, x, x^2 \right)}{\sqrt{-1 + dx} \sqrt{1 + dx}} \\
&= -\frac{a(1 - d^2 x^2)}{x \sqrt{-1 + dx} \sqrt{1 + dx}} + \frac{c \sqrt{-1 + d^2 x^2} \tanh^{-1} \left(\frac{dx}{\sqrt{-1 + d^2 x^2}} \right)}{d \sqrt{-1 + dx} \sqrt{1 + dx}} + \frac{(b \sqrt{-1 + d^2 x^2}) \text{Subst} \left(\int \frac{1}{\frac{1}{d^2} + \frac{x^2}{d^2}} dx, x, x^2 \right)}{d^2 \sqrt{-1 + dx} \sqrt{1 + dx}} \\
&= -\frac{a(1 - d^2 x^2)}{x \sqrt{-1 + dx} \sqrt{1 + dx}} + \frac{b \sqrt{-1 + d^2 x^2} \tan^{-1} \left(\sqrt{-1 + d^2 x^2} \right)}{\sqrt{-1 + dx} \sqrt{1 + dx}} + \frac{c \sqrt{-1 + d^2 x^2} \tanh^{-1} \left(\frac{dx}{\sqrt{-1 + d^2 x^2}} \right)}{d \sqrt{-1 + dx} \sqrt{1 + dx}}
\end{aligned}$$

Mathematica [A] time = 0.167041, size = 89, normalized size = 1.62

$$\frac{a(d^2 x^2 - 1) + bx \sqrt{d^2 x^2 - 1} \tan^{-1} \left(\sqrt{d^2 x^2 - 1} \right)}{x \sqrt{dx - 1} \sqrt{dx + 1}} + \frac{2c \tanh^{-1} \left(\sqrt{\frac{dx-1}{dx+1}} \right)}{d}$$

Warning: Unable to verify antiderivative.

[In] Integrate[(a + b*x + c*x^2)/(x^2*Sqrt[-1 + d*x]*Sqrt[1 + d*x]),x]

[Out] (a*(-1 + d^2*x^2) + b*x*Sqrt[-1 + d^2*x^2]*ArcTan[Sqrt[-1 + d^2*x^2]])/(x*Sqrt[-1 + d*x]*Sqrt[1 + d*x]) + (2*c*ArcTanh[Sqrt[(-1 + d*x)/(1 + d*x)]])/d

Maple [C] time = 0.017, size = 96, normalized size = 1.8

$$\frac{\text{csgn}(d)}{dx} \left(-\arctan \left(\frac{1}{\sqrt{d^2 x^2 - 1}} \right) \text{csgn}(d) dx b + \text{csgn}(d) d \sqrt{d^2 x^2 - 1} a + \ln \left(\left(\text{csgn}(d) \sqrt{d^2 x^2 - 1} + dx \right) \text{csgn}(d) \right) x \right) \sqrt{dx}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `int((c*x^2+b*x+a)/x^2/(d*x-1)^(1/2)/(d*x+1)^(1/2),x)`

[Out] $(-\arctan(1/(d^2*x^2-1)^{(1/2)})*\text{csgn}(d)*d*x*b+\text{csgn}(d)*d*(d^2*x^2-1)^{(1/2)}*a+1$
 $n((\text{csgn}(d)*(d^2*x^2-1)^{(1/2)}+d*x)*\text{csgn}(d))*x*c)*(d*x-1)^{(1/2)}*(d*x+1)^{(1/2)}$
 $*\text{csgn}(d)/(d^2*x^2-1)^{(1/2)}/d/x$

Maxima [A] time = 2.01558, size = 86, normalized size = 1.56

$$-b \arcsin\left(\frac{1}{\sqrt{d^2|x|}}\right) + \frac{c \log\left(2d^2x + 2\sqrt{d^2x^2 - 1}\sqrt{d^2}\right)}{\sqrt{d^2}} + \frac{\sqrt{d^2x^2 - 1}a}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((c*x^2+b*x+a)/x^2/(d*x-1)^(1/2)/(d*x+1)^(1/2),x, algorithm="maxima")`

[Out] $-b*\arcsin(1/(\text{sqrt}(d^2)*\text{abs}(x))) + c*\log(2*d^2*x + 2*\text{sqrt}(d^2*x^2 - 1)*\text{sqrt}(d^2))/\text{sqrt}(d^2) + \text{sqrt}(d^2*x^2 - 1)*a/x$

Fricas [A] time = 1.14288, size = 203, normalized size = 3.69

$$\frac{ad^2x + 2bdx \arctan(-dx + \sqrt{dx+1}\sqrt{dx-1}) + \sqrt{dx+1}\sqrt{dx-1}ad - cx \log(-dx + \sqrt{dx+1}\sqrt{dx-1})}{dx}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((c*x^2+b*x+a)/x^2/(d*x-1)^(1/2)/(d*x+1)^(1/2),x, algorithm="fricas")`

[Out] $(a*d^2*x + 2*b*d*x*\arctan(-d*x + \text{sqrt}(d*x + 1)*\text{sqrt}(d*x - 1)) + \text{sqrt}(d*x + 1)*\text{sqrt}(d*x - 1)*a*d - c*x*\log(-d*x + \text{sqrt}(d*x + 1)*\text{sqrt}(d*x - 1)))/(d*x)$

Sympy [C] time = 27.9255, size = 216, normalized size = 3.93

$$\frac{adG_{6,6}^{5,3}\left(\begin{matrix} \frac{5}{4}, \frac{7}{4}, 1 \\ 1, \frac{5}{4}, \frac{7}{2}, \frac{7}{4}, 2 \end{matrix} \middle| \frac{1}{d^2x^2}\right) - iadG_{6,6}^{2,6}\left(\begin{matrix} \frac{1}{2}, \frac{3}{4}, 1, \frac{5}{4}, \frac{3}{2}, 1 \\ \frac{3}{4}, \frac{5}{4} \end{matrix} \middle| \frac{e^{2i\pi}}{d^2x^2}\right) - bG_{6,6}^{5,3}\left(\begin{matrix} \frac{3}{4}, \frac{5}{4}, 1 \\ \frac{1}{2}, \frac{3}{4}, 1, \frac{5}{4}, \frac{3}{2} \end{matrix} \middle| \frac{1}{d^2x^2}\right) + ibG_{6,6}^{2,6}\left(\begin{matrix} 1, 1, \frac{3}{2} \\ 0 \end{matrix} \middle| \frac{1}{d^2x^2}\right)}{4\pi^{\frac{3}{2}} - 4\pi^{\frac{3}{2}} - 4\pi^{\frac{3}{2}} + \dots}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((c*x**2+b*x+a)/x**2/(d*x-1)**(1/2)/(d*x+1)**(1/2),x)

[Out] -a*d*meijerg(((5/4, 7/4, 1), (3/2, 3/2, 2)), ((1, 5/4, 3/2, 7/4, 2), (0,)),
 1/(d**2*x**2))/(4*pi**(3/2)) - I*a*d*meijerg(((1/2, 3/4, 1, 5/4, 3/2, 1),
 ()), ((3/4, 5/4), (1/2, 1, 1, 0)), exp_polar(2*I*pi)/(d**2*x**2))/(4*pi**(3
 /2)) - b*meijerg(((3/4, 5/4, 1), (1, 1, 3/2)), ((1/2, 3/4, 1, 5/4, 3/2), (0
 ,)), 1/(d**2*x**2))/(4*pi**(3/2)) + I*b*meijerg(((0, 1/4, 1/2, 3/4, 1, 1),
 ()), ((1/4, 3/4), (0, 1/2, 1/2, 0)), exp_polar(2*I*pi)/(d**2*x**2))/(4*pi**
 (3/2)) + c*meijerg(((1/4, 3/4), (1/2, 1/2, 1, 1)), ((0, 1/4, 1/2, 3/4, 1, 0
), ()), 1/(d**2*x**2))/(4*pi**(3/2)*d) - I*c*meijerg(((-1/2, -1/4, 0, 1/4,
 1/2, 1), ()), ((-1/4, 1/4), (-1/2, 0, 0, 0)), exp_polar(2*I*pi)/(d**2*x**2
)/(4*pi**(3/2)*d)

Giac [A] time = 2.66535, size = 112, normalized size = 2.04

$$\frac{2bd \arctan\left(\frac{1}{2}(\sqrt{dx+1} - \sqrt{dx-1})^2\right) - \frac{8ad^2}{(\sqrt{dx+1} - \sqrt{dx-1})^4 + 4} + c \log\left((\sqrt{dx+1} - \sqrt{dx-1})^2\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((c*x^2+b*x+a)/x^2/(d*x-1)^(1/2)/(d*x+1)^(1/2),x, algorithm="giac")

[Out] -(2*b*d*arctan(1/2*(sqrt(d*x + 1) - sqrt(d*x - 1))^2) - 8*a*d^2/((sqrt(d*x + 1) - sqrt(d*x - 1))^4 + 4) + c*log((sqrt(d*x + 1) - sqrt(d*x - 1))^2))/d

$$3.158 \quad \int \frac{a+bx+cx^2}{x^3\sqrt{-1+dx}\sqrt{1+dx}} dx$$

Optimal. Leaf size=83

$$\frac{1}{2} (ad^2 + 2c) \tan^{-1} \left(\sqrt{dx-1}\sqrt{dx+1} \right) + \frac{a\sqrt{dx-1}\sqrt{dx+1}}{2x^2} + \frac{b\sqrt{dx-1}\sqrt{dx+1}}{x}$$

[Out] (a*Sqrt[-1 + d*x]*Sqrt[1 + d*x])/(2*x^2) + (b*Sqrt[-1 + d*x]*Sqrt[1 + d*x])/x + ((2*c + a*d^2)*ArcTan[Sqrt[-1 + d*x]*Sqrt[1 + d*x]])/2

Rubi [A] time = 0.188847, antiderivative size = 129, normalized size of antiderivative = 1.55, number of steps used = 6, number of rules used = 6, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}} = 0.188$, Rules used = {1610, 1807, 807, 266, 63, 205}

$$\frac{\sqrt{d^2x^2-1}(ad^2+2c)\tan^{-1}\left(\sqrt{d^2x^2-1}\right)}{2\sqrt{dx-1}\sqrt{dx+1}} - \frac{a(1-d^2x^2)}{2x^2\sqrt{dx-1}\sqrt{dx+1}} - \frac{b(1-d^2x^2)}{x\sqrt{dx-1}\sqrt{dx+1}}$$

Antiderivative was successfully verified.

[In] Int[(a + b*x + c*x^2)/(x^3*Sqrt[-1 + d*x]*Sqrt[1 + d*x]), x]

[Out] -(a*(1 - d^2*x^2))/(2*x^2*Sqrt[-1 + d*x]*Sqrt[1 + d*x]) - (b*(1 - d^2*x^2))/(x*Sqrt[-1 + d*x]*Sqrt[1 + d*x]) + ((2*c + a*d^2)*Sqrt[-1 + d^2*x^2]*ArcTan[Sqrt[-1 + d^2*x^2]])/(2*Sqrt[-1 + d*x]*Sqrt[1 + d*x])

Rule 1610

Int[(Px_)*((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_)*((e_.) + (f_.)*(x_))^(p_), x_Symbol] :> Dist[((a + b*x)^FracPart[m]*(c + d*x)^FracPart[m])/(a*c + b*d*x^2)^FracPart[m], Int[Px*(a*c + b*d*x^2)^m*(e + f*x)^p, x], x] /; FreeQ[{a, b, c, d, e, f, m, n, p}, x] && PolyQ[Px, x] && EqQ[b*c + a*d, 0] && EqQ[m, n] && !IntegerQ[m]

Rule 1807

Int[(Pq_)*((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> With[{Q = PolynomialQuotient[Pq, c*x, x], R = PolynomialRemainder[Pq, c*x, x]}, Simp[(R*(c*x)^(m + 1)*(a + b*x^2)^(p + 1))/(a*c*(m + 1)), x] + Dist[1/(a*c*(m + 1)), Int[(c*x)^(m + 1)*(a + b*x^2)^p*ExpandToSum[a*c*(m + 1)*Q - b*R*(m + 2*p + 3)*x, x], x], x] /; FreeQ[{a, b, c, p}, x] && PolyQ[Pq, x] && LtQ

[m, -1] && (IntegerQ[2*p] || NeQ[Expon[Pq, x], 1])

Rule 807

Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] := -Simp[((e*f - d*g)*(d + e*x)^(m + 1)*(a + c*x^2)^(p + 1))/(2*(p + 1)*(c*d^2 + a*e^2)), x] + Dist[(c*d*f + a*e*g)/(c*d^2 + a*e^2), Int[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, f, g, m, p}, x] && NeQ[c*d^2 + a*e^2, 0] && EqQ[Simplify[m + 2*p + 3], 0]

Rule 266

Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] := Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]

Rule 63

Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_)^(n_)), x_Symbol] := With[{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b + (d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Denominator[m]] && IntLinearQ[a, b, c, d, m, n, x]

Rule 205

Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] := Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]

Rubi steps

$$\begin{aligned}
\int \frac{a + bx + cx^2}{x^3 \sqrt{-1 + dx} \sqrt{1 + dx}} dx &= \frac{\sqrt{-1 + d^2 x^2} \int \frac{a + bx + cx^2}{x^3 \sqrt{-1 + d^2 x^2}} dx}{\sqrt{-1 + dx} \sqrt{1 + dx}} \\
&= -\frac{a(1 - d^2 x^2)}{2x^2 \sqrt{-1 + dx} \sqrt{1 + dx}} + \frac{\sqrt{-1 + d^2 x^2} \int \frac{2b + (2c + ad^2)x}{x^2 \sqrt{-1 + d^2 x^2}} dx}{2\sqrt{-1 + dx} \sqrt{1 + dx}} \\
&= -\frac{a(1 - d^2 x^2)}{2x^2 \sqrt{-1 + dx} \sqrt{1 + dx}} - \frac{b(1 - d^2 x^2)}{x\sqrt{-1 + dx} \sqrt{1 + dx}} + \frac{\left((2c + ad^2) \sqrt{-1 + d^2 x^2}\right) \int \frac{1}{x\sqrt{-1 + d^2 x^2}} dx}{2\sqrt{-1 + dx} \sqrt{1 + dx}} \\
&= -\frac{a(1 - d^2 x^2)}{2x^2 \sqrt{-1 + dx} \sqrt{1 + dx}} - \frac{b(1 - d^2 x^2)}{x\sqrt{-1 + dx} \sqrt{1 + dx}} + \frac{\left((2c + ad^2) \sqrt{-1 + d^2 x^2}\right) \text{Subst} \left(\int \frac{1}{x\sqrt{-1 + d^2 x^2}} dx\right)}{4\sqrt{-1 + dx} \sqrt{1 + dx}} \\
&= -\frac{a(1 - d^2 x^2)}{2x^2 \sqrt{-1 + dx} \sqrt{1 + dx}} - \frac{b(1 - d^2 x^2)}{x\sqrt{-1 + dx} \sqrt{1 + dx}} + \frac{\left((2c + ad^2) \sqrt{-1 + d^2 x^2}\right) \text{Subst} \left(\int \frac{1}{\frac{1}{d^2} + d^2 x^2} dx\right)}{2d^2 \sqrt{-1 + dx} \sqrt{1 + dx}} \\
&= -\frac{a(1 - d^2 x^2)}{2x^2 \sqrt{-1 + dx} \sqrt{1 + dx}} - \frac{b(1 - d^2 x^2)}{x\sqrt{-1 + dx} \sqrt{1 + dx}} + \frac{(2c + ad^2) \sqrt{-1 + d^2 x^2} \tan^{-1} \left(\sqrt{-1 + d^2 x^2}\right)}{2\sqrt{-1 + dx} \sqrt{1 + dx}}
\end{aligned}$$

Mathematica [A] time = 0.12092, size = 82, normalized size = 0.99

$$\frac{(d^2 x^2 - 1)(a + 2bx) + x^2 \sqrt{d^2 x^2 - 1} (ad^2 + 2c) \tan^{-1} \left(\sqrt{d^2 x^2 - 1}\right)}{2x^2 \sqrt{dx - 1} \sqrt{dx + 1}}$$

Antiderivative was successfully verified.

[In] Integrate[(a + b*x + c*x^2)/(x^3*Sqrt[-1 + d*x]*Sqrt[1 + d*x]),x]

[Out] ((a + 2*b*x)*(-1 + d^2*x^2) + (2*c + a*d^2)*x^2*Sqrt[-1 + d^2*x^2]*ArcTan[Sqrt[-1 + d^2*x^2]])/(2*x^2*Sqrt[-1 + d*x]*Sqrt[1 + d*x])

Maple [C] time = 0.018, size = 103, normalized size = 1.2

$$-\frac{(\text{csgn}(d))^2}{2x^2} \sqrt{dx - 1} \sqrt{dx + 1} \left(\arctan \left(\frac{1}{\sqrt{d^2 x^2 - 1}} \right) x^2 ad^2 + 2 \arctan \left(\frac{1}{\sqrt{d^2 x^2 - 1}} \right) x^2 c - 2 \sqrt{d^2 x^2 - 1} x b - \sqrt{d^2 x^2 - 1} a \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `int((c*x^2+b*x+a)/x^3/(d*x-1)^(1/2)/(d*x+1)^(1/2),x)`

[Out] $-1/2*(d*x-1)^{(1/2)}*(d*x+1)^{(1/2)}*c\operatorname{sgn}(d)^2*(\arctan(1/(d^2*x^2-1)^{(1/2)}))*x^2$
 $*a*d^2+2*\arctan(1/(d^2*x^2-1)^{(1/2)})*x^2*c-2*(d^2*x^2-1)^{(1/2)}*x*b-(d^2*x^2$
 $-1)^{(1/2)}*a)/(d^2*x^2-1)^{(1/2)}/x^2$

Maxima [A] time = 2.21014, size = 88, normalized size = 1.06

$$-\frac{1}{2}ad^2\arcsin\left(\frac{1}{\sqrt{d^2|x|}}\right)-c\arcsin\left(\frac{1}{\sqrt{d^2|x|}}\right)+\frac{\sqrt{d^2x^2-1}b}{x}+\frac{\sqrt{d^2x^2-1}a}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((c*x^2+b*x+a)/x^3/(d*x-1)^(1/2)/(d*x+1)^(1/2),x, algorithm="maxima")`

[Out] $-1/2*a*d^2*\arcsin(1/(\operatorname{sqrt}(d^2)*\operatorname{abs}(x))) - c*\arcsin(1/(\operatorname{sqrt}(d^2)*\operatorname{abs}(x))) +$
 $\operatorname{sqrt}(d^2*x^2 - 1)*b/x + 1/2*\operatorname{sqrt}(d^2*x^2 - 1)*a/x^2$

Fricas [A] time = 1.05714, size = 173, normalized size = 2.08

$$\frac{2bdx^2 + 2(ad^2 + 2c)x^2 \arctan(-dx + \sqrt{dx+1}\sqrt{dx-1}) + (2bx + a)\sqrt{dx+1}\sqrt{dx-1}}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((c*x^2+b*x+a)/x^3/(d*x-1)^(1/2)/(d*x+1)^(1/2),x, algorithm="fricas")`

[Out] $1/2*(2*b*d*x^2 + 2*(a*d^2 + 2*c)*x^2*\arctan(-d*x + \operatorname{sqrt}(d*x + 1)*\operatorname{sqrt}(d*x -$
 $1)) + (2*b*x + a)*\operatorname{sqrt}(d*x + 1)*\operatorname{sqrt}(d*x - 1))/x^2$

Sympy [C] time = 34.1775, size = 212, normalized size = 2.55

$$\frac{ad^2G_{6,6}^{5,3}\left(\begin{matrix} \frac{7}{4}, \frac{9}{4}, 1 \\ \frac{3}{2}, \frac{7}{4}, 2, \frac{9}{4}, \frac{5}{2} \end{matrix} \middle| \frac{1}{d^2x^2}\right) + iad^2G_{6,6}^{2,6}\left(\begin{matrix} 1, \frac{5}{4}, \frac{3}{2}, \frac{7}{4}, 2, 1 \\ \frac{5}{4}, \frac{7}{4} \end{matrix} \middle| \frac{e^{2in}}{d^2x^2}\right)}{4\pi^{\frac{3}{2}}} - \frac{bdG_{6,6}^{5,3}\left(\begin{matrix} \frac{5}{4}, \frac{7}{4}, 1 \\ \frac{5}{4}, \frac{3}{2}, \frac{7}{4}, 2 \end{matrix} \middle| \frac{1}{d^2x^2}\right)}{4\pi^{\frac{3}{2}}} - \frac{ibd}{4\pi^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((c*x**2+b*x+a)/x**3/(d*x-1)**(1/2)/(d*x+1)**(1/2),x)

[Out] $-a*d**2*meijerg(((7/4, 9/4, 1), (2, 2, 5/2)), ((3/2, 7/4, 2, 9/4, 5/2), (0,)), 1/(d**2*x**2))/(4*pi**(3/2)) + I*a*d**2*meijerg(((1, 5/4, 3/2, 7/4, 2, 1), ()), ((5/4, 7/4), (1, 3/2, 3/2, 0)), exp_polar(2*I*pi)/(d**2*x**2))/(4*pi**(3/2)) - b*d*meijerg(((5/4, 7/4, 1), (3/2, 3/2, 2)), ((1, 5/4, 3/2, 7/4, 2), (0,)), 1/(d**2*x**2))/(4*pi**(3/2)) - I*b*d*meijerg(((1/2, 3/4, 1, 5/4, 3/2, 1), ()), ((3/4, 5/4), (1/2, 1, 1, 0)), exp_polar(2*I*pi)/(d**2*x**2))/(4*pi**(3/2)) - c*meijerg(((3/4, 5/4, 1), (1, 1, 3/2)), ((1/2, 3/4, 1, 5/4, 3/2), (0,)), 1/(d**2*x**2))/(4*pi**(3/2)) + I*c*meijerg(((0, 1/4, 1/2, 3/4, 1, 1), ()), ((1/4, 3/4), (0, 1/2, 1/2, 0)), exp_polar(2*I*pi)/(d**2*x**2))/(4*pi**(3/2))$

Giac [B] time = 1.46926, size = 196, normalized size = 2.36

$$\frac{(ad^3 + 2cd) \arctan\left(\frac{1}{2}(\sqrt{dx+1} - \sqrt{dx-1})^2\right) + \frac{2(ad^3(\sqrt{dx+1}-\sqrt{dx-1})^6 - 4bd^2(\sqrt{dx+1}-\sqrt{dx-1})^4 - 4ad^3(\sqrt{dx+1}-\sqrt{dx-1})^2 - 16bd^2)}{((\sqrt{dx+1}-\sqrt{dx-1})^4 + 4)^2}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((c*x^2+b*x+a)/x^3/(d*x-1)^(1/2)/(d*x+1)^(1/2),x, algorithm="giac")

[Out] $-((a*d^3 + 2*c*d)*arctan(1/2*(sqrt(d*x + 1) - sqrt(d*x - 1))^2) + 2*(a*d^3*(sqrt(d*x + 1) - sqrt(d*x - 1))^6 - 4*b*d^2*(sqrt(d*x + 1) - sqrt(d*x - 1))^4 - 4*a*d^3*(sqrt(d*x + 1) - sqrt(d*x - 1))^2 - 16*b*d^2)/((sqrt(d*x + 1) - sqrt(d*x - 1))^4 + 4)^2)/d$

$$3.159 \quad \int \frac{a+bx+cx^2}{x^4\sqrt{-1+dx}\sqrt{1+dx}} dx$$

Optimal. Leaf size=116

$$\frac{\sqrt{dx-1}\sqrt{dx+1}(2ad^2+3c)}{3x} + \frac{a\sqrt{dx-1}\sqrt{dx+1}}{3x^3} + \frac{1}{2}bd^2 \tan^{-1}\left(\sqrt{dx-1}\sqrt{dx+1}\right) + \frac{b\sqrt{dx-1}\sqrt{dx+1}}{2x^2}$$

[Out] (a*Sqrt[-1 + d*x]*Sqrt[1 + d*x])/(3*x^3) + (b*Sqrt[-1 + d*x]*Sqrt[1 + d*x])/(2*x^2) + ((3*c + 2*a*d^2)*Sqrt[-1 + d*x]*Sqrt[1 + d*x])/(3*x) + (b*d^2*ArcTan[Sqrt[-1 + d*x]*Sqrt[1 + d*x]])/2

Rubi [A] time = 0.220846, antiderivative size = 171, normalized size of antiderivative = 1.47, number of steps used = 7, number of rules used = 7, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}} = 0.219$, Rules used = {1610, 1807, 835, 807, 266, 63, 205}

$$-\frac{(1-d^2x^2)(2ad^2+3c)}{3x\sqrt{dx-1}\sqrt{dx+1}} - \frac{a(1-d^2x^2)}{3x^3\sqrt{dx-1}\sqrt{dx+1}} - \frac{b(1-d^2x^2)}{2x^2\sqrt{dx-1}\sqrt{dx+1}} + \frac{bd^2\sqrt{d^2x^2-1}\tan^{-1}\left(\sqrt{d^2x^2-1}\right)}{2\sqrt{dx-1}\sqrt{dx+1}}$$

Antiderivative was successfully verified.

[In] Int[(a + b*x + c*x^2)/(x^4*Sqrt[-1 + d*x]*Sqrt[1 + d*x]),x]

[Out] -(a*(1 - d^2*x^2))/(3*x^3*Sqrt[-1 + d*x]*Sqrt[1 + d*x]) - (b*(1 - d^2*x^2))/(2*x^2*Sqrt[-1 + d*x]*Sqrt[1 + d*x]) - ((3*c + 2*a*d^2)*(1 - d^2*x^2))/(3*x*Sqrt[-1 + d*x]*Sqrt[1 + d*x]) + (b*d^2*Sqrt[-1 + d^2*x^2]*ArcTan[Sqrt[-1 + d^2*x^2]])/(2*Sqrt[-1 + d*x]*Sqrt[1 + d*x])

Rule 1610

Int[(Px_)*((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_)*((e_.) + (f_.)*(x_))^(p_.), x_Symbol] :> Dist[((a + b*x)^FracPart[m]*(c + d*x)^FracPart[m])/(a*c + b*d*x^2)^FracPart[m], Int[Px*(a*c + b*d*x^2)^m*(e + f*x)^p, x], x] /; FreeQ[{a, b, c, d, e, f, m, n, p}, x] && PolyQ[Px, x] && EqQ[b*c + a*d, 0] && EqQ[m, n] && !IntegerQ[m]

Rule 1807

Int[(Pq_)*((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> With[{Q = PolynomialQuotient[Pq, c*x, x], R = PolynomialRemainder[Pq, c*x, x]}, S imp[(R*(c*x)^(m + 1)*(a + b*x^2)^(p + 1))/(a*c*(m + 1)), x] + Dist[1/(a*c*(

$m + 1$)), Int[(c*x)^(m + 1)*(a + b*x^2)^p*ExpandToSum[a*c*(m + 1)*Q - b*R*(m + 2*p + 3)*x, x], x] /; FreeQ[{a, b, c, p}, x] && PolyQ[Pq, x] && LtQ[m, -1] && (IntegerQ[2*p] || NeQ[Expon[Pq, x], 1])

Rule 835

Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[((e*f - d*g)*(d + e*x)^(m + 1)*(a + c*x^2)^(p + 1))/((m + 1)*(c*d^2 + a*e^2)), x] + Dist[1/((m + 1)*(c*d^2 + a*e^2)), Int[(d + e*x)^(m + 1)*(a + c*x^2)^p*Simp[(c*d*f + a*e*g)*(m + 1) - c*(e*f - d*g)*(m + 2*p + 3)*x, x], x], x] /; FreeQ[{a, c, d, e, f, g, p}, x] && NeQ[c*d^2 + a*e^2, 0] && LtQ[m, -1] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p])

Rule 807

Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> -Simp[((e*f - d*g)*(d + e*x)^(m + 1)*(a + c*x^2)^(p + 1))/(2*(p + 1)*(c*d^2 + a*e^2)), x] + Dist[(c*d*f + a*e*g)/(c*d^2 + a*e^2), Int[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, f, g, m, p}, x] && NeQ[c*d^2 + a*e^2, 0] && EqQ[Simplify[m + 2*p + 3], 0]

Rule 266

Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]

Rule 63

Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_)^(n_)), x_Symbol] :> With[{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b + (d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Denominator[m]] && IntLinearQ[a, b, c, d, m, n, x]

Rule 205

Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]

Rubi steps

$$\begin{aligned}
\int \frac{a + bx + cx^2}{x^4 \sqrt{-1 + dx} \sqrt{1 + dx}} dx &= \frac{\sqrt{-1 + d^2 x^2} \int \frac{a + bx + cx^2}{x^4 \sqrt{-1 + d^2 x^2}} dx}{\sqrt{-1 + dx} \sqrt{1 + dx}} \\
&= -\frac{a(1 - d^2 x^2)}{3x^3 \sqrt{-1 + dx} \sqrt{1 + dx}} + \frac{\sqrt{-1 + d^2 x^2} \int \frac{3b + (3c + 2ad^2)x}{x^3 \sqrt{-1 + d^2 x^2}} dx}{3\sqrt{-1 + dx} \sqrt{1 + dx}} \\
&= -\frac{a(1 - d^2 x^2)}{3x^3 \sqrt{-1 + dx} \sqrt{1 + dx}} - \frac{b(1 - d^2 x^2)}{2x^2 \sqrt{-1 + dx} \sqrt{1 + dx}} + \frac{\sqrt{-1 + d^2 x^2} \int \frac{2(3c + 2ad^2) + 3bd^2 x}{x^2 \sqrt{-1 + d^2 x^2}} dx}{6\sqrt{-1 + dx} \sqrt{1 + dx}} \\
&= -\frac{a(1 - d^2 x^2)}{3x^3 \sqrt{-1 + dx} \sqrt{1 + dx}} - \frac{b(1 - d^2 x^2)}{2x^2 \sqrt{-1 + dx} \sqrt{1 + dx}} - \frac{(3c + 2ad^2)(1 - d^2 x^2)}{3x \sqrt{-1 + dx} \sqrt{1 + dx}} + \frac{(bd^2 \sqrt{-1 + d^2 x^2})}{2\sqrt{-1 + dx} \sqrt{1 + dx}} \\
&= -\frac{a(1 - d^2 x^2)}{3x^3 \sqrt{-1 + dx} \sqrt{1 + dx}} - \frac{b(1 - d^2 x^2)}{2x^2 \sqrt{-1 + dx} \sqrt{1 + dx}} - \frac{(3c + 2ad^2)(1 - d^2 x^2)}{3x \sqrt{-1 + dx} \sqrt{1 + dx}} + \frac{(bd^2 \sqrt{-1 + d^2 x^2})}{2\sqrt{-1 + dx} \sqrt{1 + dx}} \\
&= -\frac{a(1 - d^2 x^2)}{3x^3 \sqrt{-1 + dx} \sqrt{1 + dx}} - \frac{b(1 - d^2 x^2)}{2x^2 \sqrt{-1 + dx} \sqrt{1 + dx}} - \frac{(3c + 2ad^2)(1 - d^2 x^2)}{3x \sqrt{-1 + dx} \sqrt{1 + dx}} + \frac{(b\sqrt{-1 + d^2 x^2})}{2\sqrt{-1 + dx} \sqrt{1 + dx}} \\
&= -\frac{a(1 - d^2 x^2)}{3x^3 \sqrt{-1 + dx} \sqrt{1 + dx}} - \frac{b(1 - d^2 x^2)}{2x^2 \sqrt{-1 + dx} \sqrt{1 + dx}} - \frac{(3c + 2ad^2)(1 - d^2 x^2)}{3x \sqrt{-1 + dx} \sqrt{1 + dx}} + \frac{bd^2 \sqrt{-1 + d^2 x^2}}{2\sqrt{-1 + dx} \sqrt{1 + dx}}
\end{aligned}$$

Mathematica [A] time = 0.116229, size = 94, normalized size = 0.81

$$\frac{(d^2 x^2 - 1)(a(4d^2 x^2 + 2) + 3x(b + 2cx)) + 3bd^2 x^3 \sqrt{d^2 x^2 - 1} \tan^{-1}(\sqrt{d^2 x^2 - 1})}{6x^3 \sqrt{dx - 1} \sqrt{dx + 1}}$$

Antiderivative was successfully verified.

[In] Integrate[(a + b*x + c*x^2)/(x^4*Sqrt[-1 + d*x]*Sqrt[1 + d*x]),x]

[Out] ((-1 + d^2*x^2)*(3*x*(b + 2*c*x) + a*(2 + 4*d^2*x^2)) + 3*b*d^2*x^3*Sqrt[-1 + d^2*x^2]*ArcTan[Sqrt[-1 + d^2*x^2]])/(6*x^3*Sqrt[-1 + d*x]*Sqrt[1 + d*x])

Maple [C] time = 0.019, size = 123, normalized size = 1.1

$$-\frac{(\text{csgn}(d))^2}{6x^3} \sqrt{dx - 1} \sqrt{dx + 1} \left(3 \arctan\left(\frac{1}{\sqrt{d^2 x^2 - 1}}\right) x^3 b d^2 - 4 \sqrt{d^2 x^2 - 1} x^2 a d^2 - 6 \sqrt{d^2 x^2 - 1} x^2 c - 3 \sqrt{d^2 x^2 - 1} x b - 2 \sqrt{d^2 x^2 - 1} a \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `int((c*x^2+b*x+a)/x^4/(d*x-1)^(1/2)/(d*x+1)^(1/2),x)`

[Out] $-1/6*(d*x-1)^{(1/2)}*(d*x+1)^{(1/2)}*c\operatorname{sgn}(d)^2*(3*\arctan(1/(d^2*x^2-1)^{(1/2)}))*x^3*b*d^2-4*(d^2*x^2-1)^{(1/2)}*x^2*a*d^2-6*(d^2*x^2-1)^{(1/2)}*x^2*c-3*(d^2*x^2-1)^{(1/2)}*x*b-2*(d^2*x^2-1)^{(1/2)}*a)/(d^2*x^2-1)^{(1/2)}/x^3$

Maxima [A] time = 1.79371, size = 119, normalized size = 1.03

$$-\frac{1}{2}bd^2 \arcsin\left(\frac{1}{\sqrt{d^2|x|}}\right) + \frac{2\sqrt{d^2x^2-1}ad^2}{3x} + \frac{\sqrt{d^2x^2-1}c}{x} + \frac{\sqrt{d^2x^2-1}b}{2x^2} + \frac{\sqrt{d^2x^2-1}a}{3x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((c*x^2+b*x+a)/x^4/(d*x-1)^(1/2)/(d*x+1)^(1/2),x, algorithm="maxima")`

[Out] $-1/2*b*d^2*\arcsin(1/(\operatorname{sqrt}(d^2)*\operatorname{abs}(x))) + 2/3*\operatorname{sqrt}(d^2*x^2 - 1)*a*d^2/x + \operatorname{sqrt}(d^2*x^2 - 1)*c/x + 1/2*\operatorname{sqrt}(d^2*x^2 - 1)*b/x^2 + 1/3*\operatorname{sqrt}(d^2*x^2 - 1)*a/x^3$

Fricas [A] time = 1.03175, size = 216, normalized size = 1.86

$$\frac{6bd^2x^3 \arctan(-dx + \sqrt{dx+1}\sqrt{dx-1}) + 2(2ad^3 + 3cd)x^3 + (2(2ad^2 + 3c)x^2 + 3bx + 2a)\sqrt{dx+1}\sqrt{dx-1}}{6x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((c*x^2+b*x+a)/x^4/(d*x-1)^(1/2)/(d*x+1)^(1/2),x, algorithm="fricas")`

[Out] $1/6*(6*b*d^2*x^3*\arctan(-d*x + \operatorname{sqrt}(d*x + 1)*\operatorname{sqrt}(d*x - 1)) + 2*(2*a*d^3 + 3*c*d)*x^3 + (2*(2*a*d^2 + 3*c)*x^2 + 3*b*x + 2*a)*\operatorname{sqrt}(d*x + 1)*\operatorname{sqrt}(d*x - 1))/x^3$

Sympy [C] time = 56.6455, size = 219, normalized size = 1.89

$$\frac{ad^3 G_{6,6}^{5,3} \left(\begin{matrix} \frac{9}{4}, \frac{11}{4}, 1 \\ 2, \frac{9}{4}, \frac{5}{2}, \frac{11}{4}, 3 \end{matrix} \middle| \frac{1}{d^2 x^2} \right)}{4\pi^{\frac{3}{2}}} - \frac{iad^3 G_{6,6}^{2,6} \left(\begin{matrix} \frac{3}{2}, \frac{7}{4}, 2, \frac{9}{4}, \frac{5}{2}, 1 \\ \frac{7}{4}, \frac{9}{4} \end{matrix} \middle| \frac{e^{2i\pi}}{d^2 x^2} \right)}{4\pi^{\frac{3}{2}}} - \frac{bd^2 G_{6,6}^{5,3} \left(\begin{matrix} \frac{7}{4}, \frac{9}{4}, 1 \\ \frac{3}{2}, \frac{7}{4}, 2, \frac{9}{4}, \frac{5}{2} \end{matrix} \middle| \frac{1}{d^2 x^2} \right)}{4\pi^{\frac{3}{2}}} + \dots$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((c*x**2+b*x+a)/x**4/(d*x-1)**(1/2)/(d*x+1)**(1/2),x)

[Out] -a*d**3*meijerg(((9/4, 11/4, 1), (5/2, 5/2, 3)), ((2, 9/4, 5/2, 11/4, 3), (0,)), 1/(d**2*x**2))/(4*pi**(3/2)) - I*a*d**3*meijerg(((3/2, 7/4, 2, 9/4, 5/2, 1), ()), ((7/4, 9/4), (3/2, 2, 2, 0)), exp_polar(2*I*pi)/(d**2*x**2))/(4*pi**(3/2)) - b*d**2*meijerg(((7/4, 9/4, 1), (2, 2, 5/2)), ((3/2, 7/4, 2, 9/4, 5/2), (0,)), 1/(d**2*x**2))/(4*pi**(3/2)) + I*b*d**2*meijerg(((1, 5/4, 3/2, 7/4, 2, 1), ()), ((5/4, 7/4), (1, 3/2, 3/2, 0)), exp_polar(2*I*pi)/(d**2*x**2))/(4*pi**(3/2)) - c*d*meijerg(((5/4, 7/4, 1), (3/2, 3/2, 2)), ((1, 5/4, 3/2, 7/4, 2), (0,)), 1/(d**2*x**2))/(4*pi**(3/2)) - I*c*d*meijerg(((1/2, 3/4, 1, 5/4, 3/2, 1), ()), ((3/4, 5/4), (1/2, 1, 1, 0)), exp_polar(2*I*pi)/(d**2*x**2))/(4*pi**(3/2))

Giac [B] time = 1.68982, size = 266, normalized size = 2.29

$$\frac{3bd^3 \arctan\left(\frac{1}{2}(\sqrt{dx+1} - \sqrt{dx-1})^2\right) + \frac{2\left(3bd^3(\sqrt{dx+1} - \sqrt{dx-1})^{10} - 12cd^2(\sqrt{dx+1} - \sqrt{dx-1})^8 - 96ad^4(\sqrt{dx+1} - \sqrt{dx-1})^4 - 96cd^2(\sqrt{dx+1} - \sqrt{dx-1})^2 + 4d^4\right)}{\left((\sqrt{dx+1} - \sqrt{dx-1})^4 + 4\right)^3}}{3d}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((c*x^2+b*x+a)/x^4/(d*x-1)^(1/2)/(d*x+1)^(1/2),x, algorithm="giac")

[Out] -1/3*(3*b*d^3*arctan(1/2*(sqrt(d*x + 1) - sqrt(d*x - 1))^2) + 2*(3*b*d^3*(sqrt(d*x + 1) - sqrt(d*x - 1))^10 - 12*c*d^2*(sqrt(d*x + 1) - sqrt(d*x - 1))^8 - 96*a*d^4*(sqrt(d*x + 1) - sqrt(d*x - 1))^4 - 96*c*d^2*(sqrt(d*x + 1) - sqrt(d*x - 1))^2 - 128*a*d^4 - 192*c*d^2)/((sqrt(d*x + 1) - sqrt(d*x - 1))^4 + 4)^3)/d

Chapter 4

Listing of Grading functions

The following are the current version of the grading functions used for grading the quality of the antiderivative with reference to the optimal antiderivative included in the test suite.

There is a version for Maple and for Mathematica/Rubi. There is a version for grading Sympy and version for use with Sagemath.

The following are links to the current source code.

The following are the listings of source code of the grading functions.

4.0.1 Mathematica and Rubi grading function

```
1 (* Original version thanks to Albert Rich emailed on 03/21/2017 *)
2 (* ::Package:: *)
3
4 (* ::Subsection:: *)
5 (*GradeAntiderivative[result,optimal]*)
6
7
8 (* ::Text:: *)
9 (*If result and optimal are mathematical expressions, *)
10 (*      GradeAntiderivative[result,optimal] returns*)
11 (* "F" if the result fails to integrate an expression that*)
12 (*      is integrable*)
13 (* "C" if result involves higher level functions than necessary*)
14 (* "B" if result is more than twice the size of the optimal*)
15 (*      antiderivative*)
16 (* "A" if result can be considered optimal*)
17
18
19 GradeAntiderivative[result_,optimal_] :=
20   If[ExpnType[result]<=ExpnType[optimal],
21     If[FreeQ[result,Complex] || Not[FreeQ[optimal,Complex]],
```

```

22     If[LeafCount[result]<=2*LeafCount[optimal],
23         "A",
24         "B"],
25     "C"],
26 If[FreeQ[result,Integrate] && FreeQ[result,Int],
27     "C",
28     "F"]]
29
30
31 (* ::Text:: *)
32 (*The following summarizes the type number assigned an *)
33 (*expression based on the functions it involves*)
34 (*1 = rational function*)
35 (*2 = algebraic function*)
36 (*3 = elementary function*)
37 (*4 = special function*)
38 (*5 = hyperpergeometric function*)
39 (*6 = appell function*)
40 (*7 = rootsum function*)
41 (*8 = integrate function*)
42 (*9 = unknown function*)
43
44
45 ExpnType[expn_] :=
46     If[AtomQ[expn],
47         1,
48     If[ListQ[expn],
49         Max[Map[ExpnType,expn]],
50     If[Head[expn]===Power,
51         If[IntegerQ[expn[[2]]],
52             ExpnType[expn[[1]]],
53         If[Head[expn[[2]]]===Rational,
54             If[IntegerQ[expn[[1]]] || Head[expn[[1]]]===Rational,
55                 1,
56                 Max[ExpnType[expn[[1]],2]],
57             Max[ExpnType[expn[[1]],ExpnType[expn[[2]],3]],
58     If[Head[expn]===Plus || Head[expn]===Times,
59         Max[ExpnType[First[expn]],ExpnType[Rest[expn]]],
60     If[ElementaryFunctionQ[Head[expn]],
61         Max[3,ExpnType[expn[[1]]],
62     If[SpecialFunctionQ[Head[expn]],
63         Apply[Max,Append[Map[ExpnType,Apply[List,expn]],4]],
64     If[HypergeometricFunctionQ[Head[expn]],
65         Apply[Max,Append[Map[ExpnType,Apply[List,expn]],5]],
66     If[AppellFunctionQ[Head[expn]],
67         Apply[Max,Append[Map[ExpnType,Apply[List,expn]],6]],
68     If[Head[expn]===RootSum,
```

```

69   Apply[Max, Append[Map[ExpnType, Apply[List, expn]], 7]],
70   If[Head[expn]===Integrate || Head[expn]===Int,
71     Apply[Max, Append[Map[ExpnType, Apply[List, expn]], 8]],
72   9]]]]]]]]]]
73
74
75 ElementaryFunctionQ[func_] :=
76   MemberQ[{
77     Exp, Log,
78     Sin, Cos, Tan, Cot, Sec, Csc,
79     ArcSin, ArcCos, ArcTan, ArcCot, ArcSec, ArcCsc,
80     Sinh, Cosh, Tanh, Coth, Sech, Csch,
81     ArcSinh, ArcCosh, ArcTanh, ArcCoth, ArcSech, ArcCsch
82   }, func]
83
84
85 SpecialFunctionQ[func_] :=
86   MemberQ[{
87     Erf, Erfc, Erfi,
88     FresnelS, FresnelC,
89     ExpIntegralE, ExpIntegralEi, LogIntegral,
90     SinIntegral, CosIntegral, SinhIntegral, CoshIntegral,
91     Gamma, LogGamma, PolyGamma,
92     Zeta, PolyLog, ProductLog,
93     EllipticF, EllipticE, EllipticPi
94   }, func]
95
96
97 HypergeometricFunctionQ[func_] :=
98   MemberQ[{Hypergeometric1F1, Hypergeometric2F1, HypergeometricPFQ}, func]
99
100
101 AppellFunctionQ[func_] :=
102   MemberQ[{AppellF1}, func]

```

4.0.2 Maple grading function

```

1 # File: GradeAntiderivative.mpl
2 # Original version thanks to Albert Rich emailed on 03/21/2017
3
4 #Nasser 03/22/2017 Use Maple leaf count instead since buildin
5 #Nasser 03/23/2017 missing 'ln' for ElementaryFunctionQ added
6 #Nasser 03/24/2017 corrected the check for complex result
7 #Nasser 10/27/2017 check for leafsize and do not call ExpnType()
8 #
9 #Nasser 12/22/2019 Added debug flag, added 'dilog' to special functions
10 #
11 see problem 156, file Apostol_Problems

```

```

11
12 GradeAntiderivative := proc(result,optimal)
13 local leaf_count_result, leaf_count_optimal,ExpnType_result,ExpnType_optimal,
    debug:=false;
14
15     leaf_count_result:=leafcount(result);
16     #do NOT call ExpnType() if leaf size is too large. Recursion problem
17     if leaf_count_result > 500000 then
18         return "B";
19     fi;
20
21     leaf_count_optimal:=leafcount(optimal);
22
23     ExpnType_result:=ExpnType(result);
24     ExpnType_optimal:=ExpnType(optimal);
25
26     if debug then
27         print("ExpnType_result",ExpnType_result," ExpnType_optimal=",
    ExpnType_optimal);
28     fi;
29
30 # If result and optimal are mathematical expressions,
31 # GradeAntiderivative[result,optimal] returns
32 #   "F" if the result fails to integrate an expression that
33 #     is integrable
34 #   "C" if result involves higher level functions than necessary
35 #   "B" if result is more than twice the size of the optimal
36 #     antiderivative
37 #   "A" if result can be considered optimal
38
39 #This check below actually is not needed, since I only
40 #call this grading only for passed integrals. i.e. I check
41 #for "F" before calling this. But no harm of keeping it here.
42 #just in case.
43
44
45 if not type(result,freeof('int')) then
46     return "F";
47 end if;
48
49
50 if ExpnType_result<=ExpnType_optimal then
51     if debug then
52         print("ExpnType_result<=ExpnType_optimal");
53     fi;
54     if is_contains_complex(result) then
55         if is_contains_complex(optimal) then

```

```

56     if debug then
57         print("both result and optimal complex");
58     fi;
59     #both result and optimal complex
60     if leaf_count_result<=2*leaf_count_optimal then
61         return "A";
62     else
63         return "B";
64     end if
65     else #result contains complex but optimal is not
66         if debug then
67             print("result contains complex but optimal is not");
68         fi;
69         return "C";
70     end if
71     else # result do not contain complex
72         # this assumes optimal do not as well
73         if debug then
74             print("result do not contain complex, this assumes optimal do not
as well");
75         fi;
76         if leaf_count_result<=2*leaf_count_optimal then
77             if debug then
78                 print("leaf_count_result<=2*leaf_count_optimal");
79             fi;
80             return "A";
81         else
82             if debug then
83                 print("leaf_count_result>2*leaf_count_optimal");
84             fi;
85             return "B";
86         end if
87     end if
88     else #ExpnType(result) > ExpnType(optimal)
89         if debug then
90             print("ExpnType(result) > ExpnType(optimal)");
91         fi;
92         return "C";
93     end if
94
95 end proc:
96
97 #
98 # is_contains_complex(result)
99 # takes expressions and returns true if it contains "I" else false
100 #
101 #Nasser 032417

```

```

102 is_contains_complex:= proc(expression)
103   return (has(expression,I));
104 end proc:
105
106 # The following summarizes the type number assigned an expression
107 # based on the functions it involves
108 # 1 = rational function
109 # 2 = algebraic function
110 # 3 = elementary function
111 # 4 = special function
112 # 5 = hyperpergeometric function
113 # 6 = appell function
114 # 7 = rootsum function
115 # 8 = integrate function
116 # 9 = unknown function
117
118 ExpnType := proc(expn)
119   if type(expn,'atomic') then
120     1
121   elif type(expn,'list') then
122     apply(max,map(ExpnType,expn))
123   elif type(expn,'sqrt') then
124     if type(op(1,expn),'rational') then
125       1
126     else
127       max(2,ExpnType(op(1,expn)))
128     end if
129   elif type(expn,'^^') then
130     if type(op(2,expn),'integer') then
131       ExpnType(op(1,expn))
132     elif type(op(2,expn),'rational') then
133       if type(op(1,expn),'rational') then
134         1
135       else
136         max(2,ExpnType(op(1,expn)))
137       end if
138     else
139       max(3,ExpnType(op(1,expn)),ExpnType(op(2,expn)))
140     end if
141   elif type(expn,'^+^') or type(expn,'`*`') then
142     max(ExpnType(op(1,expn)),max(ExpnType(rest(expn))))
143   elif ElementaryFunctionQ(op(0,expn)) then
144     max(3,ExpnType(op(1,expn)))
145   elif SpecialFunctionQ(op(0,expn)) then
146     max(4,apply(max,map(ExpnType,[op(expn)])))
147   elif HypergeometricFunctionQ(op(0,expn)) then
148     max(5,apply(max,map(ExpnType,[op(expn)])))

```



```

149   elif AppellFunctionQ(op(0,expn)) then
150       max(6,apply(max,map(ExpnType,[op(expn)])))
151   elif op(0,expn)='int' then
152       max(8,apply(max,map(ExpnType,[op(expn)]))) else
153       9
154   end if
155 end proc:
156
157
158 ElementaryFunctionQ := proc(func)
159     member(func,[
160         exp,log,ln,
161         sin,cos,tan,cot,sec,csc,
162         arcsin,arccos,arctan,arccot,arcsec,arccsc,
163         sinh,cosh,tanh,coth,sech,csch,
164         arcsinh,arccosh,arctanh,arccoth,arcsech,arccsch])
165 end proc:
166
167 SpecialFunctionQ := proc(func)
168     member(func,[
169         erf,erfc,erfi,
170         FresnelS,FresnelC,
171         Ei,Ei,Li,Si,Ci,Shi,Chi,
172         GAMMA,lnGAMMA,Psi,Zeta,polylog,dilog,LambertW,
173         EllipticF,EllipticE,EllipticPi])
174 end proc:
175
176 HypergeometricFunctionQ := proc(func)
177     member(func,[Hypergeometric1F1,hypergeom,HypergeometricPFQ])
178 end proc:
179
180 AppellFunctionQ := proc(func)
181     member(func,[AppellF1])
182 end proc:
183
184 # u is a sum or product. rest(u) returns all but the
185 # first term or factor of u.
186 rest := proc(u) local v;
187     if nops(u)=2 then
188         op(2,u)
189     else
190         apply(op(0,u),op(2..nops(u),u))
191     end if
192 end proc:
193
194 #leafcount(u) returns the number of nodes in u.
195 #Nasser 3/23/17 Replaced by build-in leafCount from package in Maple

```

```

196 leafcount := proc(u)
197     MmaTranslator[Mma][LeafCount](u);
198 end proc:

```

4.0.3 Sympy grading function

```

1 #Dec 24, 2019. Nasser M. Abbasi:
2 #           Port of original Maple grading function by
3 #           Albert Rich to use with Sympy/Python
4 #Dec 27, 2019 Nasser. Added `RootSum`. See problem 177, Timofeev file
5 #           added 'exp_polar'
6 from sympy import *
7
8 def leaf_count(expr):
9     #sympy do not have leaf count function. This is approximation
10    return round(1.7*count_ops(expr))
11
12 def is_sqrt(expr):
13     if isinstance(expr,Pow):
14         if expr.args[1] == Rational(1,2):
15             return True
16         else:
17             return False
18     else:
19         return False
20
21 def is_elementary_function(func):
22     return func in [exp,log,ln,sin,cos,tan,cot,sec,csc,
23                    asin,acos,atan,acot,asec,acsc,sinh,cosh,tanh,coth,sech,csch,
24                    asinh,acosh,atanh,acoth,asech,acsch
25                    ]
26
27 def is_special_function(func):
28     return func in [ erf,erfc,erfi,
29                    fresnels,fresnelc,Ei,Ei,Li,Si,Ci,Shi,Chi,
30                    gamma,loggamma,digamma,zeta,polylog,LambertW,
31                    elliptic_f,elliptic_e,elliptic_pi,exp_polar
32                    ]
33
34 def is_hypergeometric_function(func):
35     return func in [hyper]
36
37 def is_appell_function(func):
38     return func in [appellf1]
39
40 def is_atom(expn):
41     try:

```

```

42     if expn.isAtom or isinstance(expn,int) or isinstance(expn,float):
43         return True
44     else:
45         return False
46
47     except AttributeError as error:
48         return False
49
50 def expnType(expn):
51     debug=False
52     if debug:
53         print("expn=",expn,"type(expn)=",type(expn))
54
55     if is_atom(expn):
56         return 1
57     elif isinstance(expn,list):
58         return max(map(expnType, expn)) #apply(max,map(ExpnType,expn))
59     elif is_sqrt(expn):
60         if isinstance(expn.args[0],Rational): #type(op(1,expn),'rational')
61             return 1
62         else:
63             return max(2,expnType(expn.args[0])) #max(2,ExpnType(op(1,expn)))
64     elif isinstance(expn,Pow): #type(expn,'^^')
65         if isinstance(expn.args[1],Integer): #type(op(2,expn),'integer')
66             return expnType(expn.args[0]) #ExpnType(op(1,expn))
67         elif isinstance(expn.args[1],Rational): #type(op(2,expn),'rational')
68             if isinstance(expn.args[0],Rational): #type(op(1,expn),'rational')
69                 return 1
70             else:
71                 return max(2,expnType(expn.args[0])) #max(2,ExpnType(op(1,expn)
72 ))
73     else:
74         return max(3,expnType(expn.args[0]),expnType(expn.args[1])) #max(3,
75 ExpnType(op(1,expn)),ExpnType(op(2,expn)))
76     elif isinstance(expn,Add) or isinstance(expn,Mul): #type(expn,'+' or type
77 (expn,'*')
78         m1 = expnType(expn.args[0])
79         m2 = expnType(list(expn.args[1:]))
80         return max(m1,m2) #max(ExpnType(op(1,expn)),max(ExpnType(rest(expn))))
81     elif is_elementary_function(expn.func): #ElementaryFunctionQ(op(0,expn))
82         return max(3,expnType(expn.args[0])) #max(3,ExpnType(op(1,expn)))
83     elif is_special_function(expn.func): #SpecialFunctionQ(op(0,expn))
84         m1 = max(map(expnType, list(expn.args)))
85         return max(4,m1) #max(4,apply(max,map(ExpnType,[op(expn)])))
86     elif is_hypergeometric_function(expn.func): #HypergeometricFunctionQ(op(0,
87 expn))
88         m1 = max(map(expnType, list(expn.args)))

```

```

85     return max(5,m1)    #max(5,apply(max,map(ExpnType,[op(expn)])))
86 elif is_appell_function(expn.func):
87     m1 = max(map(expnType, list(expn.args)))
88     return max(6,m1)    #max(5,apply(max,map(ExpnType,[op(expn)])))
89 elif isinstance(expn,RootSum):
90     m1 = max(map(expnType, list(expn.args))) #Apply[Max,Append[Map[ExpnType,
Apply[List,expn]],7]],
91     return max(7,m1)
92 elif str(expn).find("Integral") != -1:
93     m1 = max(map(expnType, list(expn.args)))
94     return max(8,m1)    #max(5,apply(max,map(ExpnType,[op(expn)])))
95 else:
96     return 9
97
98 #main function
99 def grade_antiderivative(result,optimal):
100
101     leaf_count_result  = leaf_count(result)
102     leaf_count_optimal = leaf_count(optimal)
103
104     expnType_result  = expnType(result)
105     expnType_optimal = expnType(optimal)
106
107     if str(result).find("Integral") != -1:
108         return "F"
109
110     if expnType_result <= expnType_optimal:
111         if result.has(I):
112             if optimal.has(I): #both result and optimal complex
113                 if leaf_count_result <= 2*leaf_count_optimal:
114                     return "A"
115                 else:
116                     return "B"
117             else: #result contains complex but optimal is not
118                 return "C"
119         else: # result do not contain complex, this assumes optimal do not as
well
120             if leaf_count_result <= 2*leaf_count_optimal:
121                 return "A"
122             else:
123                 return "B"
124     else:
125         return "C"

```

4.0.4 SageMath grading function

1 #Dec 24, 2019. Nasser: Ported original Maple grading function by

```

2 #           Albert Rich to use with Sagemath. This is used to
3 #           grade Fracas, Giac and Maxima results.
4 #Dec 24, 2019. Nasser: Added 'exp_integral_e' and 'sng', 'sin_integral'
5 #           'arctan2','floor','abs','log_integral'
6
7 from sage.all import *
8 from sage.symbolic.operators import add_vararg, mul_vararg
9
10 def tree(expr):
11     debug=False;
12     if debug:
13         print ("Enter tree(expr), expr=",expr)
14         print ("expr.operator()=",expr.operator())
15         print ("expr.operands()=",expr.operands())
16         print ("map(tree, expr.operands()=",map(tree, expr.operands()))
17
18     if expr.operator() is None:
19         return expr
20     else:
21         return [expr.operator()+list(map(tree, expr.operands()))
22
23 def leaf_count(anti):
24     debug=False;
25
26     if debug: print ("Enter leaf_count, anti=", anti, " len(anti)=", len(anti))
27
28     if len(anti) == 0: #special check for optimal being 0 for some test cases.
29         if debug: print ("len(anti) == 0")
30         return 1
31     else:
32         if debug: print ("round(1.35*len(flatten(tree(anti))))=",round(1.35*len(
33         flatten(tree(anti))))
34         return round(1.35*len(flatten(tree(anti)))) #fudge factor
35         #since this estimate of leaf count is bit lower than
36         #what it should be compared to Mathematica's
37
38 def is_sqrt(expr):
39     debug=False;
40     if expr.operator() == operator.pow: #isinstance(expr,Pow):
41         if expr.operands()[1]==1/2: #expr.args[1] == Rational(1,2):
42             if debug: print ("expr is sqrt")
43             return True
44         else:
45             return False
46     else:
47         return False

```

```

48 def is_elementary_function(func):
49     debug = False
50
51     m = func.name() in ['exp','log','ln',
52         'sin','cos','tan','cot','sec','csc',
53         'arcsin','arccos','arctan','arccot','arcsec','arccsc',
54         'sinh','cosh','tanh','coth','sech','csch',
55         'arcsinh','arccosh','arctanh','arccoth','arcsech','arccsch','sgn',
56         'arctan2','floor','abs'
57     ]
58     if debug:
59         if m:
60             print ("func ", func , " is elementary_function")
61         else:
62             print ("func ", func , " is NOT elementary_function")
63
64
65     return m
66
67 def is_special_function(func):
68     debug = False
69
70     if debug: print ("type(func)=", type(func))
71
72     m= func.name() in ['erf','erfc','erfi','fresnel_sin','fresnel_cos','Ei',
73         'Ei','Li','Si','sin_integral','Ci','cos_integral','Shi','
74     sinh_integral'
75         'Chi','cosh_integral','gamma','log_gamma','psi,zeta',
76         'polylog','lambert_w','elliptic_f','elliptic_e',
77         'elliptic_pi','exp_integral_e','log_integral']
78
79     if debug:
80         print ("m=",m)
81         if m:
82             print ("func ", func ," is special_function")
83         else:
84             print ("func ", func ," is NOT special_function")
85
86     return m
87
88
89 def is_hypergeometric_function(func):
90     return func.name() in ['hypergeometric','hypergeometric_M','hypergeometric_U
91     ']
92
93 def is_appell_function(func):

```

```

93     return func.name() in ['hypergeometric']    #[appellf1] can't find this in
          sagemath
94
95 def is_atom(expn):
96
97     #thanks to answer at https://ask.sagemath.org/question/49179/what-is-sagemath-equivalent-to-atomic-type-in-maple/
98     try:
99         if expn.parent() is SR:
100             return expn.operator() is None
101         if expn.parent() in (ZZ, QQ, AA, QQbar):
102             return expn in expn.parent() # Should always return True
103         if hasattr(expn.parent(),"base_ring") and hasattr(expn.parent(),"gens"):
104             return expn in expn.parent().base_ring() or expn in expn.parent().
          gens()
105         return False
106
107     except AttributeError as error:
108         return False
109
110
111 def expnType(expn):
112     debug=False
113
114     if debug:
115         print(">>>>Enter expnType, expn=", expn)
116         print(">>>>is_atom(expn)=", is_atom(expn))
117
118     if is_atom(expn):
119         return 1
120     elif type(expn)==list:    #isinstance(expn,list):
121         return max(map(expnType, expn))    #apply(max,map(ExpnType,expn))
122     elif is_sqrt(expn):
123         if type(expn.operands()[0])==Rational: #type(isinstance(expn.args[0],
          Rational):
124             return 1
125         else:
126             return max(2,expnType(expn.operands()[0]))    #max(2,expnType(expn.
          args[0]))
127     elif expn.operator() == operator.pow:    #isinstance(expn,Pow)
128         if type(expn.operands()[1])==Integer:    #isinstance(expn.args[1],Integer)
129             return expnType(expn.operands()[0])    #expnType(expn.args[0])
130         elif type(expn.operands()[1])==Rational:    #isinstance(expn.args[1],
          Rational)
131             if type(expn.operands()[0])==Rational: #isinstance(expn.args[0],
          Rational)
132                 return 1

```

```

133         else:
134             return max(2,expnType(expn.operands()[0])) #max(2,expnType(expn.
args[0]))
135         else:
136             return max(3,expnType(expn.operands()[0]),expnType(expn.operands()
[1])) #max(3,expnType(expn.operands()[0]),expnType(expn.operands()[1]))
137         elif expn.operator() == add_vararg or expn.operator() == mul_vararg: #
isinstance(expn,Add) or isinstance(expn,Mul)
138             m1 = expnType(expn.operands()[0]) #expnType(expn.args[0])
139             m2 = expnType(expn.operands()[1:]) #expnType(list(expn.args[1:]))
140             return max(m1,m2) #max(ExpnType(op(1,expn)),max(ExpnType(rest(expn))))
141         elif is_elementary_function(expn.operator()): #is_elementary_function(expn.
func)
142             return max(3,expnType(expn.operands()[0]))
143         elif is_special_function(expn.operator()): #is_special_function(expn.func)
144             m1 = max(map(expnType, expn.operands())) #max(map(expnType, list(
expn.args)))
145             return max(4,m1) #max(4,m1)
146         elif is_hypergeometric_function(expn.operator()): #
is_hypergeometric_function(expn.func)
147             m1 = max(map(expnType, expn.operands())) #max(map(expnType, list(
expn.args)))
148             return max(5,m1) #max(5,m1)
149         elif is_appell_function(expn.operator()):
150             m1 = max(map(expnType, expn.operands())) #max(map(expnType, list(
expn.args)))
151             return max(6,m1) #max(6,m1)
152         elif str(expn).find("Integral") != -1: #this will never happen, since it
153             #is checked before calling the grading function that is passed.
154             #but kept it here.
155             m1 = max(map(expnType, expn.operands())) #max(map(expnType, list(
expn.args)))
156             return max(8,m1) #max(5,apply(max,map(ExpnType,[op(expn)])))
157         else:
158             return 9
159
160 #main function
161 def grade_antiderivative(result,optimal):
162     debug = False;
163
164     if debug: print ("Enter grade_antiderivative for sagemath")
165
166     leaf_count_result = leaf_count(result)
167     leaf_count_optimal = leaf_count(optimal)
168
169     if debug: print ("leaf_count_result=", leaf_count_result, "
leaf_count_optimal=",leaf_count_optimal)

```



```
170
171
172     expnType_result = expnType(result)
173     expnType_optimal = expnType(optimal)
174
175     if debug: print ("expnType_result=", expnType_result, "expnType_optimal=",
176                     expnType_optimal)
177
178     if expnType_result <= expnType_optimal:
179         if result.has(I):
180             if optimal.has(I): #both result and optimal complex
181                 if leaf_count_result <= 2*leaf_count_optimal:
182                     return "A"
183             else:
184                 return "B"
185         else: #result contains complex but optimal is not
186             return "C"
187     else: # result do not contain complex, this assumes optimal do not as
188         well
189         if leaf_count_result <= 2*leaf_count_optimal:
190             return "A"
191         else:
192             return "B"
193     else:
194         return "C"
```